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Peace Time Patriotism

By Geo. B. Cortelyou

President, Consolidated Gas Company of New York

IT has been said that "patriotism consists just as much in believing in one's country in a depression as in fighting for it in a war." Few will dispute this statement, difficult though it be to give it practical application; for it is in some respects harder to overcome a depression, many of whose elements are invisible, intangible and incalculable, than to overthrow the armed forces of a visible foe, whose numbers and resources are known.

A depression has its casualties no less than war; like war, it entails sacrifice and suffering, from which no class is exempt. In fact, a depression is a kind of war in which we are all enlisted "for the duration," whether we will or not. It is up to us to play our part and do our duty as good soldiers.

One of the first essentials is morale. A spirit of defeatism at this time is as dangerous as it would have been in 1917-18. To give way to panic or despair would be the surest means of precipitating the very disaster we are trying to avoid. Nor is there just ground for such an attitude. When we remember the optimism that was rampant only a few years ago, when confidence in a never-ending prosperity was unbounded, and when we realize—as we do now—how unwarranted such a state of mind was, does not this suggest at least the possibility that the opposite state of mind may be equally unwarranted?

True, we have lost much, but we have more left, and what we have left is far more important than what we have lost. We have suffered no catastrophe of nature; we have not been stricken by earthquake, famine or pestilence. Our farms, mines, railroads and factories are still intact. Indeed, so far as our production facilities are concerned, we are embarrassed not by too little but by too much. This does not mean that everybody's wants have been satisfied, and a surplus left over. It means that the basis of exchange by which normally the markets are cleared of goods has been disrupted, with a resultant stoppage in the customary flow of goods into consumption. The immediate and pressing need is to establish right conditions for the resumption of the interrupted flow.

Many of the adjustments necessary to bring this about have been or are being made; many yet remain to be made. Just when the point marking the turn will be reached nobody knows. Probably no one will recognize it when it appears but only after a certain perspective has been gained. The problem, however, is gradually becoming more clearly defined, and with clearer definition is coming a better understanding of the measures to be taken. This is not a time for shallow optimism, for sitting back in the complacent belief that "everything will be all right," but for calm and reasoned confidence in the future of our country made effective by a combination of faith and works—a combination which has won for us in the past and will do so again.

This country has never lost a war and will not lose this one.

Last month, *The Daily Reporter,* White Plains, N. Y., inaugurated a series of "Guest" editorials, written by distinguished men, and the first, reproduced above, came from the pen of Mr. Cortelyou.

AMERICAN GAS ASSOCIATION MONTHLY

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U. G. I. Celebrates Fifty Years of Service

Chairman Samuel T. Bodine Signally Honored—Mr. Cortelyou and Other Guest Speakers Pay Tribute to Management

THE United Gas Improvement Company, Philadelphia, Pennsylvania, rounded out a half-century of service on June 1. This Golden Anniversary was observed with appropriate ceremonies and a luncheon, participated in by more than 200 company executives, public officials and public utility leaders.

A large bronze tablet executed by Dr. R. Tait McKenzie, noted Philadelphia sculptor, was unveiled as a monument to the achievements of U. G. I. The tablet is symbolic of gas and electricity unshackling labor. It will be permanently displayed in one of the show windows in the U. G. I. Building foyer.

Originally it was planned to have the tablet unveiled personally by Chairman Samuel T. Bodine, whose employment exactly coincides with the founding of the company. Mr. Bodine, however, due to illness, was confined to his home.

So that he could take part in the ceremony, an amplifier and an electric control system were installed in his home and at the proper moment he unveiled the tablet by pushing a switch button.

A gold medal, a replica of the tablet, was presented to Mr. Bodine at his home later in the day by Morris L. Clothier, senior director of U. G. I., on behalf of the company, its directors, its officers and its many thousands of employees.

President John E. Zimmermann opened the celebration with a brief resumé of the company's progress and sketched the historic, scientific and economic changes in this country in the past fifty years. His talk, which brought great applause, follows:

"Today is the golden anniversary of The United Gas Improvement Company and we are gathered here to celebrate and commemorate this event.

"In Philadelphia, with its many century-old firms and businesses, a fifty-year commercial life is not at all unusual. Nevertheless, we felt that this anniversary should not pass unnoticed since it marks the completion of a half-century of service of the first public utility holding company in the United States. Likewise it has seemed to me that on this occasion we should look backward and try to evaluate briefly those events in our national life during the past fifty years which have had an influence on our past and will continue their influence in the future.

"From small beginnings, when first established on June 1, 1882, with a capital of $827,750, The United Gas Improvement Company under the able leadership of my predecessors, has grown until it is now capitalized at $279,276,634. From approximately $322,000 for its first fiscal year, its income has grown to approximately $34,750,000. It has an uninterrupted history of dividends during forty-seven years of its life, or since 1885, during which period aggregate cash dividends of approximately $225,427,000 have been paid to its stockholders.

"The fifty-year period ending today

has been marked by many outstanding events of both a progressive and retrogressive nature, all of which have had a profound effect upon our social and economic life. Probably one of the most significant in some respects, of these many progressive events was the opening of the first commercial electric generating station in New York three months after the U. G. I. was organized. When Thomas A. Edison put the Pearl Street plant into operation, the commercial birth of the present tremendous electrical industry took place, and I do not believe that it is a mistake to say that without that event the industrial expansion and cultural improvement which have occurred could not have taken place.

"The steam turbine, developed by Dr. Parsons, and first brought to the United States in 1895, was an epoch making event. It made possible the construction of mammoth generating stations for reasonable outlays of capital, and was a tremendous step forward in the utilization of steam. Commercially operated units were installed in 1899 of 100 to 200 kw. capacity and the first large turbine for those days, of 2,000 kw. capacity, was put in operation in 1900 at Hartford, Conn.

"The strides made in the development of this type of prime mover are best illustrated by pointing out that there are in operation today in some of the generating stations of the country, turbines of 160,000 and 208,000 kw. capacity, requiring under average conditions of load 9.5 pounds of steam to produce one kw.hr., whereas the early Hartford machine required approximately 27 pounds of steam per kw.hr.

"Another revolutionary event in the development of the light and power industry in the past fifty years has been the practical application of alternating current to the transmission of electricity for long distances. This has resulted from the improvements made in the construction of transformers whereby it has become possible to step-up the initial voltage of the electric generator, to a voltage as high as 220,000 volts, so that power is actually transported for distances of 300 or more miles.

Bronze tablet which was unveiled as a monument to the achievements of U. G. I. It portrays gas and electricity unshackling labor

"The winter of 1887-8 saw the first overhead trolley line, and in 1892 the appearance of the forerunner of the modern automobile, followed in 1903 by the first flight by a heavier-than-air flying machine, ushering in a new era of transportation.

"In the field of communication tremendous strides have been made. In 1882 only a few had telephones, while today over twenty millions are in use in the United States. In 1901 Marconi signalled the letter 'S' across the Atlantic, and in 1920 the first commercial radio station, KDKA of Westinghouse, began broadcasting.

"While these are only a very few of the outstanding accomplishments of the last fifty years, other events of an equally portentous nature have taken place which have produced grave domestic and international problems of a character so complex that a common solution has not yet been found, but which I venture to assert can be solved if less weight is given to material things and more to those spiritual qualities of faith and courage.

"In the fifty years of our domestic history there are four significant events that particularly stand out in my mind because of the profound effect that they have had on our economic and social life.

"One of these is the Seventeenth Amendment to the Constitution which went a long way towards removing the balance wheel to the Legislative branch of the Federal government, the need for which our forefathers in their wisdom and farsightedness so clearly foresaw, when they provided that Senators should be chosen by the Legislatures and not, like the members of the House, by popular vote.

"I believe it can be truthfully said that this amendment was a grave mistake, the consequences of which are now so evident in the daily goings-on in the Senate. Experience has shown

that there has been a marked change in the character and personnel of the Senate. Instead of being, as formerly, a deliberative body maintaining the equilibrium between the popular branch of the Congress and the Executive branch, it has become as destructively radical as the House. Senators chosen by the Legislatures, as originally provided, brought to the discharge of their duties a sense of national responsibility and were not so subject, as they are now, to the demands of organized minorities in their states seeking selfish, sectional or local advantage. They believed in the constitutional restrictions upon Federal activities, and I venture to say that they never would have countenanced the vast bureaucratic and inquisitorial interference with orderly business that has been accumulating in the past decade.

"Whatever may have been the criticism of the old system, we now have abundant proof that it was vastly superior to the new order of things.

"The second event, with its dire effects upon our social, economic and governmental fabric, is the Eighteenth Amendment.

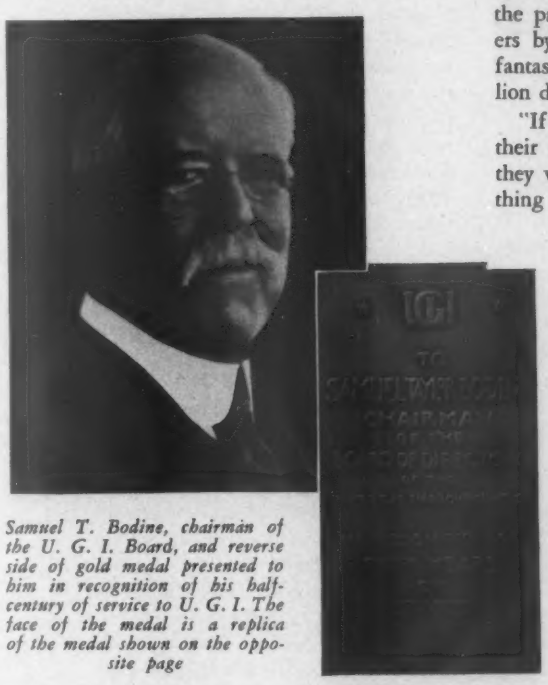
"What an appalling and prolific breeder of crime, graft and lawlessness! All of man's ingenuity could not have created a more successful instrumentality than this one with which to debauch the nation, lower the standards of morality and promote disrespect for law. It has engendered a growing disrespect for all law which must be reflected in the future.

"The third event of the past fifty years which has brought in its wake disastrous consequences, and which I believe is largely, if not entirely responsible for our present unsettled economic conditions, and in fact those of the whole world, is the World War. It accomplished nothing that could not have been accomplished by peaceful means. It left both victor and vanquished with stupendous liabilities. It has been stated by reliable authorities that 100 billion dollars of credit obligations were floated by the countries at war during the actual period of fighting.

"What a staggering loss of life and of money used for destruction, burned up and destroyed, and what a colossal debt to be paid by posterity!

"The war has intensified suspicion, jealousy and hate between nations, created a reparations problem, inter-allied debts, more and more barriers to the free intercourse of commerce and trade between nations, and probably worst of all, has retarded the spirit of internationalism.

"Even now a conference of transcending importance is to be held at Lausanne on the subject of inter-allied war debts and reparations. The eyes of the whole world will be directed to this Swiss city, for if its deliberations shall fail to produce a plan which will lead to cancellation of war debts or at least to the postponement of their payment for a time sufficiently long to permit the debtor nations to fully recover their economic strength, it will most certainly retard our own economic recovery, and add to the growth of the spirit of intense nationalism now becoming so prevalent.



Samuel T. Bodine, chairman of the U. G. I. Board, and reverse side of gold medal presented to him in recognition of his half-century of service to U. G. I. The face of the medal is a replica of the medal shown on the opposite page

"The fourth event which is having a serious effect upon our social and economic life, and which if not arrested very soon will subject the nation to an intolerable burden, is the series of Soldiers' bonus and pension measures which are either on our statute books or proposed. It has been stated that from 1918 to 1931 we have spent nearly six billion dollars for the relief of World War veterans. It is estimated that if no change is made in existing laws, more than 21½ billion dollars will have been spent on such relief by 1945. One competent writer has pointed out that if future veteran legislation follows the course that such legislation has followed in the past, the total bill to the taxpayers by the year 1949 will reach the fantastic figure of more than 100 billion dollars.

"If the people fail to impress on their representatives in Congress that they will not stand for this sort of a thing and fail to organize so as to combat the powerful influences of organized minorities, then it is as certain as the sun rises that the present pensions, disability and relief measures now in effect will not only not be reduced but such additional vast sums of money will be expended for these purposes that in the end the nation will become bankrupt.

"I am not referring to the very proper and generous provisions already made, and which should be made, for the care and rehabilitation of the injured and the hospitalization of those who suffer from the results of wounds or disease occasioned by active war service, but I do refer to the growth of a system of war benefits to men who had not suffered any disabilities from war service, and who are not, therefore, morally entitled to such relief.

"During the lifetime of The United Gas Improvement Company there have occurred six business depressions, not counting that in which we find ourselves today. In all of these depressions, pessimism was the prevailing attitude. Deep gloom surrounded business and industry. No ray of hope could be distinguished; no break in

John E. Zimmermann, president of The United Gas Improvement Company

the depression could be seen. The future of the country and of industry was obscure; never again would business return to normal. In fact, in reading accounts of those hard times, one is struck with the similarity of the language used, and as a matter of fact, in most instances the accounts seem to describe exactly the situation as it exists today.

"It is unnecessary to call your attention to the fact that better times followed each of these periods; that business and industry did improve; that the country did not go 'to the dogs'; and that our national wealth after each of these years of hard times was considerably increased.

"So it is with the present depression. It is not my intention to dismiss lightly the tremendous difficulties which have faced us in business and industry, and as individuals, in the past two and a half years. But I would impress upon you that American business has weathered twenty depressions and that the road to recovery from our present economic upheaval is not to be found in the innumerable panaceas and suggestions now being offered nor in the hope that if sufficient laws are passed we can be legislated out of the depression.

"I am a firm believer in America and its institutions. I know that this depression will pass away and that the country will have a return of good times, although I believe that our period of wild prosperity was not worth the bill which is now being paid in the form of a great human suffering, destruction of morale, receiverships, bankruptcies, and what not. It is only by eternal watchfulness in the future that we can avoid repeating the excesses of the past.

"During the last decade we have seen a tremendous growth in amalgamations and consolidations in all branches of business, sometimes built on sound economic principles and therefore of advantage to the people, but, unfortunately, sometimes actuated by the selfish desires of men to create empires regardless of the soundness of their economic principles.

"My friends, it has unfortunately taken this depression to bring us to the realization that not sufficient constructive thinking was done during our periods of prosperity. One of its most shocking revelations is not the fortunes that have been lost or the misery and distress brought to millions of our people—which God knows is bad enough—but the evidences of corruption in government and business, accompanied by the sad spectacle of the loss of confidence in many of our leaders.

"I believe that one of the contributory causes to the fear and distrust which is so prevalent today is this loss of confidence and the knowledge that too often decisions and actions have been entirely guided by sordid considerations and too seldom by those higher principles of honesty, decency and ethics to which no one should be a stranger.

"The crying need of the hour is for honest and fearless leadership in high places, and I am also inclined to think that this leadership must come from within our business world and not entirely from Washington. I cannot do better in expressing what I believe is needed than to quote the following by Walter Lippman:

> "'Those in high places are more than the administrators of Government bureaus. They are more than the writers of laws. They are the custodians of a nation's ideals, of the beliefs it cherishes, of its permanent hopes, of the faith which makes a nation out of a mere aggregation of individuals. They are unfaithful to that trust when by word and example they promote a spirit that is complacent, evasive and acquisitive.
>
> "'It is not only against the material consequences of this decade of drift and hallucination but against the essence of its spirit that the best and bravest among us are today in revolt. They are looking for new leaders, for men who are truthful and resolute and eloquent in the conviction that the American destiny is to be free and magnanimous, rather than complacent and acquisitive; they are looking for leaders who will talk to the people not about two-car garages and a bonus but about their duty and about the sacrifices they must make, and about the discipline they must impose upon themselves, and about their responsibility to the world and to posterity, about all those things which make a people self-respecting, serene and confident. May they not look in vain.'

"In conclusion let me say that it has seemed proper that the memorial of this anniversary should, in some manner, pay tribute to the part that gas and electricity have played in the development of the industrial life and cultural advantages of our times and in which development we feel that the U. G. I. has had a prominent part. A suitable tablet was the logical means of accomplishing our desires. In the execution of the tablet we were fortunate to secure the sympathetic assistance of Dr. R. Tait McKenzie, who has created a dignified and lasting memorial to the accomplishments of the gas and electrical industries.

"We had planned to have the tablet unveiled by Samuel T. Bodine, the present chairman of the Board of Directors, who entered the service of The United Gas Improvement Company when it was formed, and who was its president for fourteen years. Mr. Bodine's kindliness and support have been of inestimable value to me during my three years of administration and nobody can regret more than I do his enforced absence from this, our golden anniversary. However, he will press a button at his home in *Villa Nova* which will unveil the tablet.

"It is our privilege and pleasure to ask Mr. Bodine to unveil the tablet."

Directly following Mr. Zimmermann's words, Mr. Bodine pressed the button and the tablet which stood to one side of the stage was unveiled. The tremendous applause certainly must have thrilled Mr. Bodine at his home.

Morris L. Clothier, in a brief address, paid tribute to Mr. Bodine and

his guidance of U. G. I. affairs. He said:

"The unveiling of the tablet by Mr. Bodine was especially appropriate, not only because he is chairman of the Board of Directors of The United Gas Improvement Company, but also because he is the oldest employee in point of service in the company. We regret exceedingly that he was not here in person to perform that act.

"I have been associated with Mr. Bodine as a director of The United Gas Improvement Company since 1908, and have learned to love and admire him.

"Truly it has been said that every institution is but the lengthened shadow of a man. Its ideals and policies, its standing in the business and financial world, are measures of the character of the men who mould its policies and guide its destinies.

"This is literally true of The United Gas Improvement Company. Its ideals, its high standard of business ethics and reputation for financial stability, the just and equitable treatment of customers and employees, it owes in large measure to the man who for fifty years has given his life to this institution—Samuel Taylor Bodine.

"Entering the service of the company when it was formed in 1882, Mr. Bodine has occupied the positions of secretary and treasurer, general manager, vice-president and president, and was elected chairman of the Board of Directors in 1926, which position he now holds. He has, therefore, given practically his whole business life to The United Gas Improvement Company, and the imprint of his kindly, but firm guidance is a heritage of the utmost value to the company. His philosophy of life may be summed up in the words of his message to all U. G. I. employees upon his fortieth anniversary: 'Forty years of preparation are behind us, and splendid possibilities are ahead of us, if we hold fast to our old standards of loyalty to one another, to our shareholders, and to the public, and develop by study and application such facilities for efficient service with which God and our parents may have endowed us.'

"In 1927 Mr. Bodine was presented with the first Samuel T. Bodine Meritorious Service Medal, 'in recognition of 45 years of unceasing effort to promote the highest standards of public utility service throughout the United States.' This but partially describes the business life of this outstanding figure, not only of The United Gas Improvement Company, but of the entire public utility industry.

"Therefore, on behalf of The United Gas Improvement Company, its directors, its officers, and its many thousands of employees, it is my privilege to congratulate Mr. Bodine on the completion of fifty years of service with this company.

"This term coincides exactly with the life of the company, for from the day of its inception until the present he has been an influential, capable member of its personnel.

"In this, the golden year of the company and of Mr. Bodine's identification with it, it is also my privilege and honor to present him with this token of our admiration and affection, which expresses in a very small way our grateful and sincere appreciation of the value of his thought, counsel and administration during the half century just ended.

"It is our hope and prayer that Mr. Bodine may be spared a long time yet to enjoy happiness, health and prosperity, and that it may be our privilege to continue our association with him for many years to come.

"It will give me particular pleasure to give to Mr. Bodine later in the day, on your behalf, this gold medal, a replica of the tablet which he has just unveiled, in recognition of fifty years of service."

In introducing the Mayor of Philadelphia, one of the guest speakers, Mr. Zimmermann said:

"It may be of interest to refer briefly to the close contact that the U. G. I. has had with the people of Philadelphia throughout its more than thirty-four years of operation of the Philadelphia Gas Works. The Gas Works have always been owned by the city since gas was first turned into the mains on February 10, 1836, when the price was $3.50 per 1,000 cubic feet, but until operation was assumed by U. G. I. under a lease dated November 12, 1897, gas activities in Philadelphia underwent many vicissitudes. Although it was not until 1897 that the city turned over to the U. G. I. the complete operation of the Gas Works, the first actual relations between the city and the company took place in 1890, gas being purchased by the city from the Philadelphia Gas Improvement Company, acquired by the U. G. I. Company in that year. Thus, for forty-two out of the fifty years of its life, The United Gas Improvement Company has been privileged to serve the city of Philadelphia.

George B. Cortelyou, president of the Consolidated Gas Company of New York

"The period since 1897 has been marked by splendid progress and close cooperation between the city and company in the affairs of the Gas Works. During the 30-year period covered by the lease of 1897 which ended December 31, 1927, nearly 34 millions of dollars were added to the city's gas property in the form of plant, gas holders, mains, services, meters, transportation equipment, etc.

"The sales of gas to private customers in 1896, the last full year of city operation, amounted to approximately 3¾ billion cubic feet, while in 1927, the last year under the original lease, such sales amounted to approximately 18¼ billion cubic feet. So satisfactory was the operation of The United Gas Improvement Company under the 30-year lease dated 1897, that in 1926 a new agreement was entered into between the city and the U. G. I., effective January 1, 1928, upon the expiration of the original lease. The new agreement was authorized by City Council without a dissenting vote.

"Therefore, it is particularly appropriate that we should have with us today the Mayor of Philadelphia, and I have great honor in presenting the Honorable J. Hampton Moore."

The Mayor's address, in part, follows:

"The Mayor was exceedingly pleased when the officers of The United Gas Improvement Company invited him to participate in these Fiftieth Anniversary exercises.

"The Mayor recalls as a young man attending the meetings of the old Gas Trust, when it met on Seventh Street, in Philadelphia, in what was known as the Gas Trust Building. He recalls the efforts of the engineers those days to produce a light satisfactory to the people and heat which would also be useful and beneficial. He recalls the political conditions that prevailed and some of the things that were said about the Gas Trustees and the management, and he learned to think then that perhaps, after all, it was better that the government keep out of business just as far as that were possible, and let business take care of itself, with government support. He holds that view today with respect to the great municipality which competes with private enterprise in a manner not wholly satisfactory and interferes with personal incentive and initiative.

"Then the Mayor recalls, too, the organization of The United Gas Improvement Company. Young as he still is he can see some of the earlier pioneers, even at the Columbia Club, at Broad and Oxford Streets, discussing the possibilities of this company, if only a sufficient number could be found to take the stock to provide the capital for its operation.

"The Mayor had frequent contact with Mr. Bodine and was one of council who voted against the first lease.

"Mr. Bodine was one of those men serving the public as well as the company at that time. He is a man whom we admired and continue to admire and whom we shall perhaps long acclaim as one of the leading citizens of Philadelphia and vicinity who has rendered public service.

"It seems that this earlier story of the gas situation in Philadelphia is extremely appropriate to this occasion. It is mighty interesting for the citizens of Philadelphia to know that they have a value such as that represented by The United Gas Improvement Company's leased works. The city of Philadelphia is still the owner of this great plant which constitutes an asset along with many others, and by continuing as an asset will give the lie to some of those who have suspected that this city is not solvent. Notwithstanding present financial troubles it will ultimately be able to meet all its obligations and proceed in the spirit that formerly prevailed, with the same solidity and strength that has existed since the days of William Penn.

"The Mayor came here today not only to speak of the city's interest in this property and to congratulate the taxpayers generally as to the values here represented, for which they may be taxed and which they may regard as an asset, but to congratulate the stockholders and officers of The United Gas Improvement Company upon the excellent management of the company, upon the revenue it has produced, the advertising it has done for the city of Philadelphia throughout the whole United States, because its by-products are known everywhere, and upon the public service which it represents.

"When the old Gas Trust conducted the city's gas business the service was poor, the treatment accorded consumers was such as to approach a scandal and the price of gas was high; the plant was run down and there was general dissatisfaction. Today The United Gas Improvement Company pays the city more than $4,000,000 annually, the plant is being kept up; polite attention is given the consumer, who is solicited to extend his business, while he pays about one-third less for gas.

"In conclusion, the Mayor congratulates The United Gas Improvement Company, its officers and stockholders upon the completion of fifty years of successful operation and service. He hopes it may continue with equal success through the coming years, that it will increase and expand its service to the people and find the way—this is not altogether facetious—to do so profitably at lower rates and at increased rentals."

In introducing George B. Cortelyou, president of the Consolidated Gas Company of New York, the next speaker, Mr. Zimmermann paid him a tribute. He said:

"The slogan of the public utility industry is 'Service.' Until every member of our organization has adopted that slogan for his own, he cannot be a success in this field. Service must be the keynote of his life; it must be ingrained in him.

"I am particularly happy at this time to be able to introduce the next speaker to you as a man who has devoted his life to service. Serving directly under Presidents Cleveland, McKinley and Roosevelt, and as the first secretary of the Department of Commerce and Labor, then as Postmaster General, and later as Secretary of the Treasury, he devoted himself to the service of his country. I am sure that the experience of those years peculiarly fitted him for his entrance into the public utility industry as president of the great Consolidated Gas Company of New York.

"Every industry has its outstanding men, and I feel that the public utility industry is indeed fortunate in having many such within its ranks. However, among these, the name of the Honorable George B. Cortelyou is especially prominent, and I gratefully appreciate his coming here today, not only because of the outstanding position occupied by him in the public utility field, but also because of the close traditional friendship existing between the splendid organization which he leads and The United Gas Improvement Company.

"I take pleasure in presenting Mr. Cortelyou."

Mr. Cortelyou stated that he was deeply honored by the invitation to be present. He briefly sketched the beginning and advancement of the gas and electric industries, and the great part U. G. I. had taken in this advancement during its fifty years of existence. "The history of gas cannot be written without according a prominent place to Philadelphia and U. G. I.," was one of his statements.

Continuing, Mr. Cortelyou said:

"Why has the domestic load held up at a time when people are curtailing their expenditures in all other directions? It can only mean that our customers realize that gas and electricity are among the most economical items in the family budget. When

people have to be carefully selective in their expenditures, they naturally favor those that yield the largest return in satisfaction of their needs. In using our service to light and heat their homes, cook and preserve their food and perform many other household tasks, they find they are getting more real value for their money than they can get by a similar outlay for any other purpose. In no other direction will their dollars go as far or accomplish as much. That is why they use our facilities to the extent they do; and whatever they may hear or read to the effect that utility rates are so high as to discourage or penalize use of the product, they know by that wisest of teachers—experience—that the contrary is true, and they are not misled. The companies as well as the public are vitally interested in rate schedules that will encourage the maximum use of their product by all classes of consumers at the lowest cost compatible with good service.

"So we can and do take a just pride in the part our utilities have played and are playing in these serious times. They have generally maintained employment at a relatively high level within their own ranks, they and their employees have contributed their full share, and more, to unemployment and other relief measures, and in more ways than one have been a tower of strength in time of trouble."

Following this, Mr. Cortelyou complimented Chairman Bodine, as follows:

"Personalities are always more interesting than institutions. In today's celebration we include both. The institution is of course The United Gas Improvement Company and the personality is Samuel T. Bodine, chairman of its board of directors, whose length of service is co-equal with the life of his company. Entering the employ of the U. G. I. in 1882 as secretary and treasurer and advancing by demonsttated merit to the highest offices within the gift of his company, he with it now completes a half century of public service. How appropriate it is, therefore, that he should receive, as a memento of their common anniversary, a replica of the commemorative tablet, in the form of a gold medal —emblem of a unique record and a distinguished career. In Mr. Bodine the gas and electric industry has a representative of the type it delights to honor, of great ability and inflexible integrity, whose name is writ large in the annals of the industry he has served so long and faithfully; and on this notable anniversary I bring him the hearty congratulations and best wishes of his friends and co-workers of the Consolidated Gas Company of New York and its affiliated companies, which I am sure are echoed by the industry at large. May his helpful and stimulating presence be felt among us for many years to come."

In conclusion, Mr. Cortelyou said:

"We live in a world whose only permanency is change. No industry can afford to harbor the delusion that it is immune to the effects of change. The business highway is strewn with the wrecks of enterprises that 'stood pat' while the procession moved on. Past service is no guarantee of future success. We are proud of our title of public service corporations, but it is a title which every day has to be earned anew. Yesterday's triumphs will not redeem today's failures. Now more than ever before, through extensive and intensive research and investigation, must we explore all possible uses for our products, develop all available markets, institute all practicable efficiencies and economies, anticipate future needs and trends. The rewards of the future will go to those who have made use of the present emergency to prepare for the work ahead.

"Service is still the biggest word in the utility lexicon, though it has been so much overworked in all directions that one almost hesitates to use it. Nevertheless, the things for which it stands have not been overworked. Too often it is honored more in the breach than in the observance. It will do us no good to shout service from the housetops unless we practice it a little lower down, inside the house. We must make it function not in generalized statements but in specific performance. Aside from the business of supplying a commodity of the highest quality at the lowest price, utility service is a series of definite human contacts through which the relations between company and customer are maintained on a basis of mutual respect, understanding and good will. This is the kind of service the public has a right to expect of us. It can ask no more; we can give no less.

"For a half century the U. G. I. has stood in the forefront of progressive utility organizations. From small beginnings it has grown to its present proportions—not by leaps and bounds but by the sounder process of gradual accretions spread over the years. It has lived up to the 'Improvement' in its name. With it, increasing size has meant enlarged opportunity for service. On its roster, past and present, are the names of men famous in the industry as technicians and administrators, and under the leadership of President Zimmermann we may be sure that its best traditions will be worthily upheld. An asset to every community in which it operates, its strength and stability have been not only a local but a national constructive force. It has contributed to as well as benefited by the growth of the country during the last fifty years. From its long and honorable past it draws inspiration and hope for the future; and as it sets out upon its march for the second half-century mark, we wish it a safe and prosperous journey."

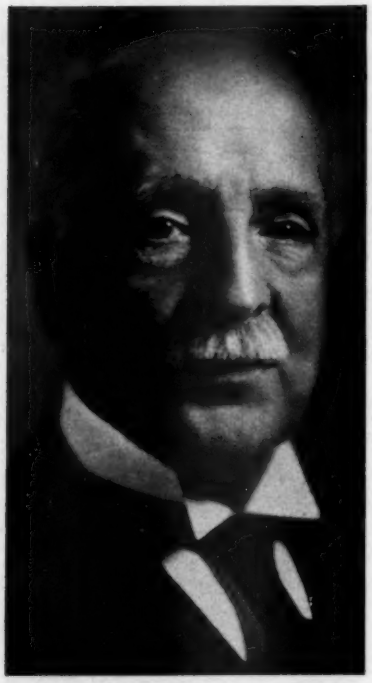
A luncheon followed at the Bellevue-Stratford Hotel.

Near the finish of the luncheon, Vice-President Philip H. Gadsden in a few words paid a tribute to President Zimmermann and his capable guidance of U. G. I. affairs, and made a surprise presentation to Mr. Zimmermann of a plaquette of the tablet. In presenting the plaquette, Mr. Gadsden said:

"Before bringing this celebration to a close, I desire, on behalf of the committee in charge, to pay a tribute to the man who at this time guides the policies of the U. G. I. and is charged with responsibility for their execution. What the world needs today, and what the public utility industry must have, is leadership of a high order. We feel that this occasion will not have served its full purpose and that these ceremonies will not be complete unless, in an appropriate manner, recognition be made of the high quality of leadership displayed by the President of the U. G. I., John E. Zimmermann—a leadership based not only on personal integrity, but on official integrity as

(Continued on page 297)

A. G. A. Nominating Committee Reports for 1932-33



Arthur Hewitt

To Members of the American Gas Association:

IN compliance with Section 2 of Article II of the By-Laws of the American Gas Association, announcement is hereby made to the membership of the following report of the General Nominating Committee which will be presented to the annual convention in Atlantic City, N. J., in October, 1932:

For President—Arthur Hewitt, Vice-President and General Manager, Consumers Gas Co., Toronto, Ontario.

For Vice-President—N. C. McGowen, President, United Gas Public Service Co., Houston, Texas.

For Vice-President—Howard Bruce, Chairman of Board, Bartlett-Hayward Co., Baltimore, Md.

For Treasurer—William J. Welsh, Vice-President and General Manager, New York and Richmond Gas Co., Staten Island, N.Y.

N. C. McGowen

For Directors—Two-Year Terms:

H. O. Caster, Cities Service Co., New York, N. Y.

B. J. Denman, Vice-President and General Manager, The United Light & Power Co., Chicago, Ill.

Henry L. Doherty, President, H. L. Doherty & Co., New York, N. Y.

O. H. Fogg, Vice-President, Consolidated Gas Co. of New York, New York, N. Y.

John A. Fry, Vice-President and Secretary, Detroit-Michigan Stove Co., Detroit, Mich.

Howard Bruce

Samuel Insull, Jr., Vice-President, The Peoples Gas Light & Coke Co., Chicago, Ill.

F. A. Lemke, General Manager, Humphrey Company, Kalamazoo, Mich.

Clifford E. Paige, Vice-President, The Brooklyn Union Gas Co., Brooklyn, N. Y.

W. J. Welsh

T. R. Weymouth, Vice-President, Columbia Gas & Electric Corp., New York, N. Y.

Respectfully submitted,

J. K. SWANSON, *Chairman*
L. B. DENNING
CHESTER GREY
C. R. MILLER
FRANK H. PAYNE
G. W. STILES
Nominating Committee

The following members have been nominated by Section Nominating Committees to serve as section officers for the next Association year:

Natural Gas Department: For Chairman—L. K. Langdon, Union Gas & Elec. Co., Cincinnati, Ohio; for Vice-Chairman—Frank L. Chase, Vice-President, Lone Star Gas Co., Dallas, Texas.

Accounting Section: For Chairman—J. M. Roberts, The Peoples Gas Light & Coke Co., Chicago, Ill.; for Vice-Chairman—E. B. Nutt, Standard Oil Co. of New Jersey, Pittsburgh, Pa.

Commercial Section: For Chairman—Walter C. Beckjord, Boston Consolidated Gas Co., Boston, Mass.; for Vice-Chairman—N. T. Sellman, Consolidated Gas Co. of New York, New York, N. Y.

Industrial Gas Section: For Chairman—E. L. Wilder, Utility Management Corp., New York, N. Y.; for Vice-Chairman—F. B. Jones, Equitable Gas Co., Pittsburgh, Pa.

Manufacturers' Section: For Chairman—D. B. Stokes, U. S. Pipe & Foundry Co., Burlington, N. J.; for Vice-Chairman, Appliance Div.—John A. Fry, Detroit-Michigan Stove Co., Detroit, Mich.; for Vice-Chairman, Apparatus Division—Merrill N. Davis, S. R. Dresser Manufacturing Co., Bradford, Pa.

Publicity and Advertising Section: For Chairman—Jay Barnes, New Orleans Public Service, Inc., New Orleans, La.; for Vice-Chairman—Henry Obermeyer, Consolidated Gas Co. of N. Y., New York, N. Y.

Technical Section: For Chairman—J. A. Perry, United Gas Improvement Co., Philadelphia, Pa.; for Vice-Chairman—O. S. Hagerman, American Light & Traction Co., Chicago, Ill.

Named for A. G. A. Directorate

H. O. Caster

B. J. Denman

Henry L. Doherty

O. H. Fogg

J. A. Fry

Samuel Insull, Jr.

F. A. Lemke

C. E. Paige

T. R. Weymouth

Engineers to Pay Honor to Frank J. Sprague

FRANK J. SPRAGUE, engineer, scientist and inventor, will be honored at a meeting to be held July 25, in the Engineering Societies Auditorium, New York City, celebrating his seventy-fifth anniversary. A special anniversary committee, composed of executives of engineering societies and educational institutions, has arranged a program in appreciation and tribute to Mr. Sprague's contributions to the world's welfare. Speakers will include Dr. John H. Finley, Frank Hedley and Rear Admiral S. S. Robison, U. S. N., retired.

Mr. Sprague was born in Milford, Conn., July 25, 1857, and received his education at the United States Naval Academy. He assisted Thomas Edison for one year and proceeded thereafter to his own discoveries and extensive engineering developments. In recognition of his work, Mr. Sprague has been the recipient of many awards, including the following: Gold Medal, Paris Electrical Exhibition, 1889; Grand Prize, St. Louis Exhibition, 1905; Edison Medal, A.I.E.E., 1910; Franklin Medal, Franklin Institute, 1921; D.Eng., Stevens; D.Sc., Columbia; and LL.D., Pennsylvania.

The Brooklyn Union Elects F. R. Wogan Secretary

FREDERICK R. WOGAN, assistant secretary since 1910, has been elected secretary of The Brooklyn Union Gas Company to succeed the late Henry E. McGowan. At the same time Richard B. Loomis was elected assistant secretary.

Mr. Wogan was first employed by the Fulton Municipal Gas Co. as secretary to General James Jourdan, then president of the company and father of James H. Jourdan, present head of The Brooklyn Union Gas Company.

Mr. Wogan continued as secretary to General Jourdan through the formative and early years of The Brooklyn Union Gas Company, until October, 1910, when he was elected assistant secretary of the company. He held this post until his recent promotion.

Mr. Loomis, who was born in Windsor, Conn., in 1902, was first employed by The Brooklyn Union Gas Company in 1924 as a clerk in the New Business Department. Six years later he was appointed supervisor of floor and window display in the New Business Department, the post he held at the time of his election as assistant secretary.

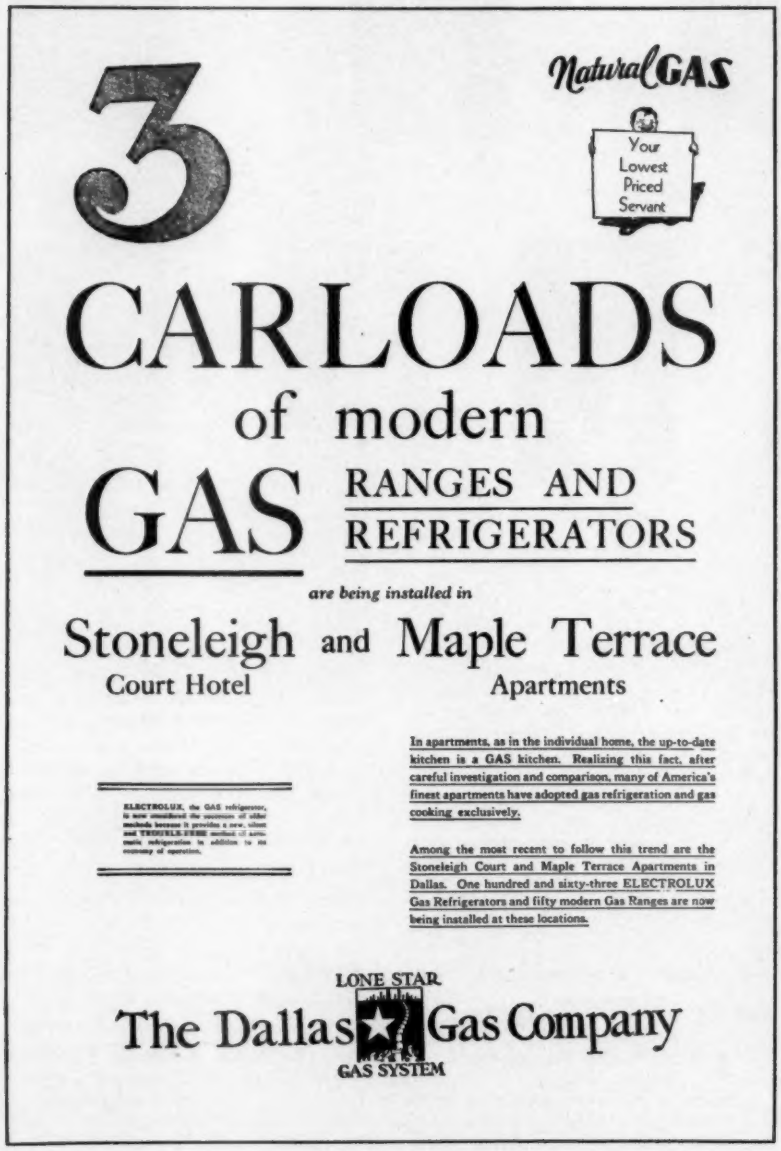
To Award Meritorious Service Medal At A. G. A. Convention

DURING the American Gas Association's Convention in Atlantic City next October, President R. W. Gallagher will present the Meritorious Service Medal to the outstanding hero of the gas industry. This award, consisting of a beautiful gold Medal and Button and a Certificate, is coveted and not only honors the recipient but the company which employs him.

Any employee of a manufactured or natural gas company or manufacturer member of the American Gas Association is eligible for the Meritorious Service Medal. It is the gas industry's official recognition for the most meritorious and conspicuous judgment, intelligence or bravery in saving human life either in the plant or works of any gas undertaking or having to do with the handling of the materials of manufacture or of the products manufactured or distributed.

Applications for the Medal to be presented at the 1932 Convention covering deed performed during the year beginning July 1, 1931, and ending June 30, 1932, must be filed at Association Headquarters on or before August 1, 1932. The conditions governing an award and application forms will be provided by Headquarters on request.

Apartments Switch to Gas for Better Service


3
Natural GAS
Your Lowest Priced Servant
CARLOADS
of modern
GAS RANGES AND REFRIGERATORS
are being installed in
Stoneleigh Court Hotel and Maple Terrace Apartments
ELECTROLUX, the GAS refrigerator, is now considered the successor of other methods because it provides a new, silent and TROUBLE-FREE method of automatic refrigeration in addition to its economy of operation.
In apartments, as in the individual home, the up-to-date kitchen is a GAS kitchen. Realizing this fact, after careful investigation and comparison, many of America's finest apartments have adopted gas refrigeration and gas cooking exclusively.
Among the most recent to follow this trend are the Stoneleigh Court and Maple Terrace Apartments in Dallas. One hundred and sixty-three ELECTROLUX Gas Refrigerators and fifty modern Gas Ranges are now being installed at these locations.
LONE STAR GAS SYSTEM
The Dallas Gas Company

ONE of the largest orders for gas refrigerators and gas ranges ever placed in the Southwest was recently received by The Dallas Gas Company, Dallas, Texas. The purchaser is James H. Turner, manager of two fashionable apartment hotels in Dallas, who ordered three carloads of modern gas equipment, consisting of 163 Electrolux refrigerators and 50 of the latest types of gas ranges, which will be installed in the kitchens of the two buildings, replacing his present electrical equipment.

Announcement of this big order for modern gas cooking and refrigeration equipment was made by The Dallas Gas Company in newspaper advertisements, one of which, greatly reduced, is reproduced herewith. On June 5, Mr. Turner told the public of his purchase in a full-page advertisement in *The Dallas Morning News*. In this advertisement, Mr. Turner said:

"Consistent with our desire to give residents of Stoneleigh Court and Maple Terrace every modern service and improved convenience, we have just completed arrangements for the installation of 163 Electrolux gas refrigerators and 50 modern gas ranges. We have changed to gas equipment because investigation has convinced us that gas cooking and gas refrigeration service are superior. This new equipment provides a speedier cooking service and silent, automatic refrigeration for apartment residents.

"The gas ranges selected are modern, automatic, insulated models finished in sparkling porcelain of ultra-smart design. The gas refrigerators are absolutely silent in operation, automatically controlled and of sufficient capacity to provide ample refrigeration as well as plenty of ice cubes for cool summer drinks."

E. Frank Gardiner Heads Utility Advertising Men

THE Public Utilities Advertising Association elected the following officers at its annual meeting in New York, last month:

President—E. Frank Gardiner, Midland United Company, Chicago.

First Vice-President—Henry Obermeyer, Consolidated Gas Company, New York.

Second Vice-President—Stanley Quinn, Electric Bond and Share Company, New York.

Third Vice-President—J. R. Pershall, Public Service Company of Northern Illinois, Chicago.

Secretary—Eric W. Swift, Commonwealth Edison Company, Chicago.

Treasurer—H. F. Weeks, Consolidated Gas Company, New York.

Directors—C. A. Tattersall, Buffalo; Morris E. Jacobs, Omaha, and J. E. Marsh, Atlanta.

British Institution President Finds Gas Industry Here Vigorous and Prosperous

J. Herbert Canning

IN his annual address before the sixty-ninth annual general meeting of The Institution of Gas Engineers, London, England, last month, President J. Herbert Canning, O.B.E., M. Inst. Gas. E., F.C.S., referred at length to his visit to the United States and Canada, last October, and his participation in the annual convention of the American Gas Association, at Atlantic City, N. J. He declared that he had been impressed and gratified to find that the gas industry here and in the Dominion was in a vigorous and prosperous state despite the general trade depression and keen competition from oil and electricity.

His address, in part, was as follows:

"The Annual General Meeting of the Institution last year constituted the First International Gas Conference and achieved a success which is full of happy augury for the future. At that meeting was initiated a new era of international cooperation which, there is every reason to hope, will be fruitful in progress both in the technical as well as in other departments of our industry. With a view to continuing and maintaining the happy relations which were set up in June last, the Council did me the honour of asking me to represent the Institution at the American Gas Convention of the American Gas Association, which was held at Atlantic City, N. J., in October last. It was decided that I should travel to the convention by way of Canada, in order that I might convey to the president and members of the Canadian Gas Association the cordial greetings and good wishes of their colleagues in the British Isles. It is very pleasing to have this opportunity of expressing my grateful and sincere thanks for the unbounded kindness and hospitality extended to me both in Canada and in the United States of America.

"On landing at Montreal, I was welcomed to Canadian soil by Major J. J. Humphreys, of the Montreal Light, Heat, and Power Company, who did everything to make my short stay in that city pleasant and interesting. The president of the Canadian Gas Association, Mr. Hugh McNair, of Winnipeg, made the journey of over 1000 miles to Toronto, where I was welcomed by him, Mr. Arthur Hewitt (vice-president of the American Gas Association and of the Consumers' Gas Company of Toronto), Mr. George W. Allen (secretary-treasurer of the Canadian Gas Association), members of the Council of the Association, and others. Similar kindness was shown me at Atlantic City, where Mr. Clifford E. Paige, the president of the American Gas Association, Major Alexander Forward, the managing director, and a host of other friends did everything possible to make my all too short stay with them happy and memorable.

Progress in Canada and America

"In the face of severe competition from oil and electricity and in spite of serious trade depression, it is gratifying to find that the Gas Industry both in Canada and the United States of America is in a vigorous and prosperous condition. In the city of Montreal, one of the most conspicuous landmarks is the new waterless gasholder; 300 ft. in height and of a capacity of ten million cu.ft., the erection of which has been necessitated by the rapidly increasing demand for gas. At Ottawa and Toronto similar conditions prevail, notwithstanding the immense development of electricity in the Province of Ontario, which is probably richer in water power than any industrial district of equal area in the world. At Toronto, which is supplied with electrical energy generated at Niagara, the rates for electricity for household use are probably lower than in any comparable community elsewhere. Notwithstanding this fact, the Consumers' Gas Company, of Toronto, has a remarkable record of continuous progress and prosperity. In the last ten years the number of gas consumers at Toronto has increased from 127,000 to 170,000, the mileage of gas mains from 600 to close upon 1000, and the total sales of gas by more than one-third. In the United States of America, in spite of the enormous extension of the use of natural gas, the sales of manufactured gas have increased from 159,000,000,000 cu.ft. in 1911, to 326,900,000,000 cu.ft. in 1921, and to 408,000,000,000 cu.ft. in 1930.

"These eminently satisfactory results have been achieved by the engineering skill and the ability, vigor, business acumen, and enthusiasm with which the problem of meeting competition has been dealt with by everyone engaged in the gas industry in those countries. Not only has the household load for cooking, water heating, fires, and central heating been increased, but the use of gas for industrial purposes has been extended and developed to a remarkable degree. It is no reflection, however, upon the ability and zeal with which the gas industry is served in Canada and the United States of

America, to point out that the absence in North America of antiquated restrictive legislation has contributed in a most material degree to their present satisfactory position. In other words, the gas industry there enjoys the same privileges and liberty as its competitors.

"These conditions present a great contrast to those prevailing in this country, where we have too long laboured under the disadvantage imposed by statutes, the earliest of which was framed to meet the conditions of an age when stage coaches were still running in many parts of the country and the practical application of electricity was unknown. Since that time the conditions under which gas supply is carried on have altered completely. The non-competitive era has passed away, and has been succeeded by an age in which the keenest competition exists. Our chief competitors enjoy absolute freedom in the framing of tariffs and rates best calculated to secure various types of business, but the relatively slight modifications which have taken place in Gas Legislation since 1847 have left the position of Gas Undertakings practically unchanged. In Canada and the United States of America suppliers of gas study the economic possibilities of various fields for the use of gas and are free to fix appropriate tariffs which will secure each type of load. The only stipulation usually laid down is that the rate shall be a just and reasonable one.

Central Heating by Gas in America

"It is customary in this country in considering the price of gas to take into account the magnitude of the individual load, whereas, in North America, the magnitude of the aggregate load is very often the determining factor. This is particularly exemplified in the case of the great central heating load which has been built up by our Canadian and American colleagues. The individual consumption is not usually as great as in the case of certain industrial users, but the total amount of business to be obtained is very large, and on this account the rates for central heating are often lower than those applicable to industrial gas. Such a course seems warranted by the fact that the load is practically continuous for twenty-four hours each day over the whole of the winter season. It has certainly been justified by the results achieved. In New England alone the number of gas central heating installations has increased from 512 in 1925 to 6861 in 1930, the average rate charged varying from 75 cents to 95 cents per 1000 cu.ft. Satisfactory as these results are, they have as yet only touched the fringe of the load, for, in 1930, even in the best developed districts, the average number of central heating installations per 1000 meters fixed was only 7.83, a small proportion in a country where central heating is so largely in use.

"When one considers the possibilities of the development of such a load in this country, the question of the difference in winter temperature naturally arises. The January isotherm of 20° F., crosses Canada near the Great Lakes, and no cold comparable to this is ever experienced in the British Isles. In our damp climate, however, even moderate degrees of cold are often more keenly felt than sub-zero temperatures in the clear, still atmosphere of a Canadian winter. It would certainly seem that, in this country, the best results would be achieved by the employment of a moderate degree of central heating supplemented by the gas fire, which ventilates and has a cheerful appearance. This would afford a combination of the advantages of both systems, more closely approximating to the ideal than any other method of warming houses at present in use. The question of the development of this load is well worth consideration. Both in the United States of America and Canada the opening up of these new fields for the use of gas has been achieved by a system of constant, intensive education of the consumer, which has led to his realizing that mere fuel cost is not the only factor in the problem and that the collateral advantages are so great as to render gas the most economical and convenient fuel both for domestic and industrial purposes."

First A. G. A. President Elected Head of N. E. L. A.

GEORGE B. CORTELYOU, president of the Consolidated Gas Company of New York and first chief executive of the American Gas Association, was elected president of the National Electric Light Association at the annual meeting of the latter organization in Atlantic City, June 10. This new honor brings to Mr. Cortelyou, one of the recognized leaders of the gas industry, the distinction of having been chosen head of both of the national gas and electric organizations. That the electrical industry selected its new chief from the ranks of gas executives is regarded as a distinct compliment to the leadership found within the gas industry.

Mr. Cortelyou was born in New York City on July 26, 1862, and was graduated from Hempstead, Long Island, Institute in 1879 and the Massachusetts State Normal School in 1882. He was a law reporter in New York from 1883 to 1885, and then for four years was principal of several college preparatory schools. In 1889 he entered the public service and was a private secretary to various officials, including the Surveyor of the Port of New York, and to the Fourth Assistant Postmaster General. In November, 1895, Mr. Cortelyou became a stenographer for President Cleveland, and was appointed executive clerk in February of the following year, assistant secretary to President McKinley in July, 1898, and secretary to the President on April 13, 1900. He was reappointed by President Roosevelt on Sept. 16, 1900, and was the first secretary of the Department of Commerce and Labor, to which post he was appointed on Feb. 16, 1903. He served until July 1, 1904.

On March 7, 1905, Mr. Cortelyou was appointed Postmaster General, serving until March 4, 1907, when he was chosen Secretary of the Treasury, serving until the end of President Roosevelt's term. From 1904 to 1907 he was chairman of the Republican National Committee.

On leaving the Cabinet, Mr. Cortelyou, on March 9, 1909, became president of the Consolidated Gas Company of New York. His home is in Huntington, L. I.

The Gas Industry— In Three Reels

By Arthur H. Loucks

Loucks and Norling Studios
New York City

WHEN the Secretary of the American Gas Association asked me several months ago to consider the possibility of assembling three single-reel silent motion pictures from films already produced by member companies covering both the manufactured and natural gas industries, I told him I didn't think it could be done, but times being what they are, we would try it.

After screening the first 50,000 feet of film, including both professional 35-millimeter and amateur 16-millimeter film, I could think of lots of other more pleasant ways of making a living.

During the past ten years many thousands of feet of motion picture film have been made by gas companies. Many of these films were of high quality in their day and as a matter of fact are still being used to advantage. Others were not so good, especially the 16-millimeter film made by amateurs. The amateur films no doubt served the purpose for which they were made but they could not be used as part of our program.

The first picture we tackled was the one on manufactured gas. Because we couldn't think of a better title we called this picture "Ideal Fuel."

In producing new pictures a tentative scenario is usually written and then the scenes are photographed. The final continuity depends largely upon the quality of the scenes obtained. In assembling "Ideal Fuel" from scenes already made and available we first had to think of a suitable introduction. It appeared that two large gas companies in different sections of the country, evidently working independently of each other, had picked on our old friend van Helmont, the Belgian alchemist and commonly accepted as the discoverer of gas, as good material for a dramatic introduction to a gas picture.

We decided that if two of the largest companies had successfully used van Helmont for an introduction, we couldn't go far wrong in using him for our picture. In one of these pictures van Helmont was a short, fat, chubby fellow and in the other he was tall, lean and Shakespeareanesque. Inasmuch as we had to use one of the van Helmont's already in existence, not having the funds to hire a new van Helmont, we used the Shakespeare type as he seemed to strike us as looking a little bit more as the Belgian alchemist ought to have looked.

A bird's-eye view of one of the modern gas plants shown in the new A. G. A. movies

In making motion pictures for theatrical purposes the producer has lots of leeway in picturing historical characters. In making motion pictures for an association of business men it is necessary to follow specifications. When this sequence was first shown to the committee some one objected to the flare of burning gas caused when van Helmont's assistant touched a flame to the crucible. We had to cut out the flare of gas, but we were able to retain the studious look of the inquiring alchemist.

In this sequence as in all others we were confronted with the problem of cutting long sequences to the footage necessary to enable us to present an over-all view of the manufactured gas industry in one reel, of fifteen minutes on the screen. To do this we had to use cross dissolves and trick photography. The original producers of the films we worked with may not recognize the scenes in the new picture, but the audience will think they were made especially for "Ideal Fuel."

A few years ago before the development of duplicating positive motion picture film it would have been impossible for us to do what we did with these films. Every foot of film in the new pictures, with the exception of titles, animated maps and charts, has been printed from a duplicate negative. The quality of the final prints we are now making from the assembled negatives is better than the prints of a few years ago made from original negative.

This young lady, the daughter of a prominent gas official, is sure gas is an "Ideal Fuel." Scene from new A. G. A. film

With one or two exceptions we found that all the motion pictures now in use by the gas industry show gas appliances that are more or less out of date. Fortunately we had available gas appliance scenes made by us during the past year for one of the member companies of the American Gas Association. The automatic gas range with time and temperature control shown in "Ideal Fuel" was made especially for this film. So this film is up-to-date in every respect and may be used by any gas company anywhere.

The industrial uses scenes were selected from a number of films and from our own library. These scenes are all typical and interesting and give the audience a general idea of 30,000 industrial uses for gas.

Almost everyone gets a different impression from looking at a motion picture, but everyone who sees "Ideal Fuel" cannot fail to be impressed with the importance and service of the manufactured gas industry.

The second reel in this series is called "How Gas Is Manufactured" and the picture is just that. By means of cross-sectional animation we show that gas is a product of the distillation of coal, leaving coke as the residue. We show both the coal gas and carburetted blue gas processes with all the principal methods of purification.

This film is purely educational. Even those who have worked most of their lives in gas plants can get something out of this picture. Most high schools take their classes on visits to industrial plants in their communities. If the pupils are given an opportunity to see this film either before or after visiting the gas plant, they will get a far better idea of how gas is manufactured. The animation explains what neither the eye nor the camera can see.

It is interesting to note that this animation was originally made by us for the Rochester Gas and Electric Corporation under the supervision of the late Robert M. Searle, then president of that company. Mr. Searle was a great believer in educational films. The Rochester film has become standard in the teaching of gas manufacture in that community. Now for the first time the entire country has an opportunity to benefit from the educational work undertaken by Mr. Searle and F. W. Fisher, of his organization.

The single reel on natural gas, called "Nature's Perfect Fuel," is probably the most interesting of the three reels. We had several excellent films from which to select scenes. The great natural gas industry with the bringing in of gas wells and the laying of 1,000-mile pipe lines across plains and swamps, over and under rivers, surmounting all obstacles, lends itself admirably to spectacular motion picture presentation.

The bringing in of a gas well shown in this film is one of the most spectacular shots ever made by a motion picture camera man. There is nothing in any industry that produces quite the thrill as that one gets from seeing mud and water shot hundreds of feet above a derrick when the gas comes in.

For this picture we were fortunate in finding some good cross-sectional animation showing the geological occurrence of natural gas and the drilling and sinking of the tubing down through the various strata to the gas dome. New animated maps were made to show the location of the principal gas fields and the network of pipe lines.

Most of the natural gas pictures made by member companies are fairly long. In "Nature's Perfect Fuel" we have assembled a single-reel film that gives an impressive over-all view of the industry in fifteen minutes on the screen. This giant among industries makes an ideal motion picture subject.

The three single-reel motion pictures "Ideal Fuel," "How Gas Is Manufactured" and "Nature's Perfect Fuel," not listed in order of their importance but in the order in which they were produced, probably give a better over-all view of an industry in a few minutes than any other industry in the country can boast. They represent a painstaking study of all the films made in the industry with the elimination of everything that would tend to distract for a minute from the main theme—the telling of the development, importance and service of the great gas industry.

These films are now obtainable from the American Gas Association on both a rental and purchase basis. Millions of people are waiting to see them.

Mr. Doull's Services Praised by N. F. P. A.

AT a recent meeting of the National Fire Protection Association, held at Atlantic City, N. J., a resolution was adopted expressing the regard of that organization for the "consistent interest and constructive participation" in the affairs of that body by R. S. Doull, of New York. Mr. Doull is the American Gas Association's representative to the Fire Protection Association.

Commercial Products From Natural Gas

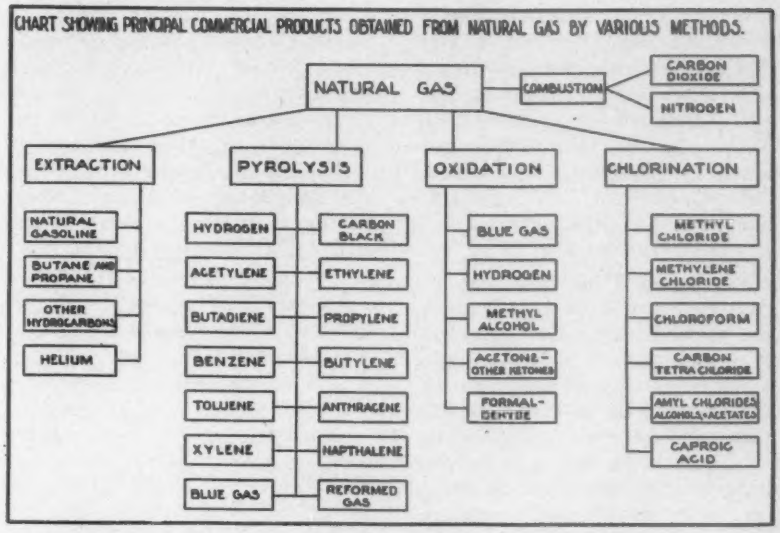
By Robert Kyle

Research Engineer,
A. G. A. Testing Laboratory

FROM the time natural gas began to receive so much popular attention, it has been customary to think of it merely as a fuel. It is surprising to learn of some of its other uses and still more so when their number is considered. At present there are approximately 23,000 commercial uses and possibilities.[1] Such utilization offers one solution for the prevalent uneconomical waste of natural gas, especially where it occurs as a by-product of the oil industry.

The topic of this paper becomes, then, much broader than one would at first suspect. It will not be possible, of course, to name and describe each of these 23,000 means of natural gas utilization. But fortunately there are general classifications and also certain constituents and products which act as parents for a large number of others. Some, too, are of considerable commercial importance or possess great potential possibilities, while quite a number are very minor in character.

Commercial products from natural gas are obtained in five general ways, (1) extraction, (2) combustion, (3) pyrolysis, (4) oxidation, and (5) chlorination. The accompanying chart presents this classification with the important primary products obtained.



Extraction

Natural gasoline plants have already become important accessories to the petroleum industry. These plants take the "wet" or casinghead gas and condense the gasoline vapors, absorbing them by the use of charcoal, or in oil with consequent redistillation. The natural gasoline thus obtained is used to enrich the gasoline from the petroleum refinery. In 1929 about 10 per cent of the total national gasoline production was accounted for in this manner, 53,183,000 barrels of natural gasoline (a value of 158 million dollars) resulting from treatment of 1,959,294 million cubic feet of natural gas.[2]

An important industry which usually operates in conjunction with the natural gasoline plant is that of the liquefied petroleum gases. Natural gas suitable for this purpose may contain but 80-85 per cent methane and ethane, practically all the remaining constituents consisting of propane, butane, pentane, and heavier gases. This 15-20 per cent fraction is liquefied by cooling and compressing and the liquid product, which can be easily transported under pressure in cylinders or tank cars, is suitable for domestic or industrial fuel, enricher for manufactured gas, and for other purposes.

The following figures show the increasing use of liquefied gases during the past six years:

Year	*Gallons*
1926	465,085
1927	1,091,005
1928	4,522,899
1929	9,930,964
1930	18,017,347
1931	28.502.819

For a segregation of the petroleum gases, it may be noted that the 1930 distribution of propane was 11,500,000 gallons (almost twice its 1929 figure) and of butane, iso-butane, pentane, and butane-pentane mixtures was about 6,500,000 gallons (approximately 50 per cent more than during 1929). Propane is the substance most suitable and most generally used for "bottled gas." The estimated number of "bottle gas" customers for 1931 was 150,000, with consumption per customer of 100 gallons.[3] The less volatile butane and other gases of this series are utilized industrially and find domestic service also in distribution from special carburetting plants.

There are quite a number of chemical uses to which hydrocarbons extracted from natural gas may be put. Some of these will be discussed later under oxidation and chlorination.

A small amount (0.5 to 2 per cent) of helium is found in natural gas of certain fields. This very light, noninflammable gas is much valued by the United States Government for use in its dirigibles. One plant is main-

[1] "Commercial and Financial Chronicle," Oct. 18, 1930, p. 2462.
[2] Figures from Commerce Year Book, 1931.
[3] Figures based on U. S. Department of Commerce reports.

tained near Fort Worth and one at Amarillo, Texas, both under strict government control. The helium is obtained by liquefying all the other gases. Commercial purity has ranged from 96 to 98 per cent, but recently 99.96 per cent purity was obtained in an experimental operation which bears some promise of commercial application. Increased purity adds a great deal to the lifting power of an airship. For example, in the Navy dirigible Akron, one per cent more purity would mean an addition of approximately two tons to the ship's useful lifting power.

Combustion

When natural gas is burned, the chief products aside from water vapor, are carbon dioxide and nitrogen, both of which may be of some value commercially. Carbon dioxide, so obtained, is utilized in a new plant at Tulsa, Oklahoma, for the production of "Dry Frost," a trade name for solid carbon dioxide, sometimes known as "dry ice." At this plant natural gas is burned under a boiler and the flue gases drawn from the stack by the suction of a blower. The flue gases contain about 10 per cent carbon dioxide, 89 per cent nitrogen, and 1 per cent other gases. The carbon dioxide is absorbed in a water solution of triethanolamine and the other gases escape. The carbon dioxide is then distilled from the solution and liquefied by compression and cooling. A certain amount is marketed in this form. The remainder passes to a "snow chamber" where expansion produces crystals of solid carbon dioxide. These crystals, or "snow," are later pressed out into cakes.

Solid carbon dioxide is a particularly convenient refrigerant. It is much handier than ice for the packing of meats, fruits, ice cream, etc. By use of a small cartridge, having a valve for regulating pressure, any temperature may be obtained in a household refrigerator. There are possibilities of using solid carbon dioxide for house cooling. The present capacity of the Tulsa plant is 12,000 pounds daily or 4,380,000 pounds per year, with provision for doubling production if the market justifies. The capacity of this plant represents a sizable proportion of the total national output of solid carbon dioxide "snow," which last year was 85,000,000 pounds from 25 plants.

Liquid carbon dioxide has already had considerable use in carbonating drinks and as a refrigerant.

At McGill University, Professor Harold Hibbert has utilized carbon dioxide from the combustion of natural gas to produce artificial silk. He has carried further the known reaction between carbon dioxide and water to form sugar and has, by steps in parallel with nature, produced cellulose. His discovery should develop an annual market for many million cubic feet of natural gas.

No present use is being made of nitrogen from the combustion of natural gas, although certain engineers are known to have the problem under consideration.

Pyrolysis

Pyrolysis means decomposition by heat or "cracking." The term may include incomplete combustion. In this manner a great number of useful products may be obtained from natural gas.

The most established industry under this classification is the production of carbon black. More than 200 million pounds are turned out yearly by the channel process which is the chief method in use. This consists of the deposition of soot upon relatively cold plates or channels from the luminous flames of natural gas combustion. The black is removed from the channels by scraping, usually done continuously by a reciprocating movement.

A knowledge of the general mechanism of the formation of carbon blacks in flames is much to be desired. In the commercial production of carbon blacks by the combustion of natural gas it has only been possible by the ordinary channel process, to produce blacks of certain definite typical properties but in low yields. By the use of special processes, operating at a higher combustion chamber temperature and without impingement of flames upon collecting surfaces, blacks have been produced in considerably higher yields but with modified properties. The causes for these differences are not known, and it has not been possible to control the variation in yield and properties, both in the desired direction, simultaneously.

Plummer and Keller[4] made a study of the production of carbon black from propane (using Pyrofax gas). Although unable to derive any simple clear-cut conclusions as to the mechanism of formation, they did ascertain the effect of various factors. Among these were (1) channel height, which should be equal to that of a free burning flame; (2) channel temperature, the optimum being 516° C. (approximately that of the usual commercial process using natural gas); (3) per cent combustion, the effect of which is slight; and (4) the effect of removal of the channels altogether, which diminished yields and properties but not to a very great extent. These results also apply to the use of natural gas in the ordinary commercial channel process, that is, to methane-ethane instead of propane. While these experiments indicated better properties and yields for propane, this advantage, from a commercial standpoint, is offset by the comparative scarcity of this material.

Carbon black is produced by the Thermatomic Carbon Company by cracking of natural gas in an intermittent cycle of passage over heated checker brick. At Louisville, the Natural Gas Hydrogen Corporation cracks natural gas by passing it through the fuel bed of an ordinary water gas generator, with consequent recovery of carbon black.

All natural gas cracking processes produce hydrogen. At temperatures ranging from 1800° to 2200° F., decomposition and recombination into other compounds may result in a number of other products. At sufficiently high temperatures the gas will completely decompose into carbon and hydrogen. Hydrogen, itself, is an extremely valuable substance. Its major uses are as a reducing agent in process industries; the hydrogenation of mineral and vegetable oils and coal; and the synthetic production of ammonia, which is widely used as a refrigerant and in the manufacture of fertilizer.

Natural gas as a source of hydrogen is adapted to two general methods. One is a cracking reaction with steam and proceeds in two stages. The first stage is endothermic, employing steam

[4] "Ind. and Eng. Chem.," Nov., 1930, pp. 1209-12.

and taking place at 1500° F. or higher, to form carbon monoxide and hydrogen. The second stage uses steam and a catalyst, taking place at about 1300° F., to convert the carbon monoxide into carbon dioxide and more hydrogen. The carbon dioxide is later absorbed. At Bayway, New Jersey, the Standard Oil Company, interested in the production of hydrogen for hydrogenation of petroleum residues, has developed a continuous treatment of this type using externally heated alloy steel tubes. The Shell Oil Company uses the same general method in an intermittent process, producing hydrogen for ammonia synthesis.

The second general method is cracking intermittently without steam and with simultaneous recovery of carbon black. Such methods are those of the Thermatomic Carbon Company and the Natural Gas Hydrogen Company, mentioned above.

Something of a picture of hydrogen formation by these two methods is shown in the following table of analyses.

Table Showing Commercial Hydrogen Obtained from Natural Gas by Method I, Steam Cracking, and Method II, Straight Cracking

	CO_2	CO	H_2	CH_4	C_2H_6	N_2	*Cu.Ft./M. Nat. Gas*
I. Natural Gas				90.0	3.0	7.0	1000
First Steam Reaction	10.0	11.9	74.5	2.0		1.6	3675
Second Steam Reaction	18.4	1.4	77.0	1.8		1.4	4080
After CO_2 Absorption	0.7	1.8	93.3	2.3		1.9	3460
II. Natural Gas				90.0	3.0	7.0	1000
Cracked Natural Gas		2.0	91.0	4.0		3.0	2000

It has been demonstrated that natural gas as a source of hydrogen is considerably cheaper than blue water gas, another common source.[5]

It should now be apparent that blue gas (chiefly a mixture of carbon monoxide and hydrogen) if wanted for some special purpose, could easily be obtained by steam cracking of natural gas, perhaps using a catalyst. It may often be desirable to do this. Blue gas is the basis of many syntheses and where blue gas is required for a process, instead of making it in the usual water gas generator, it might be much more economical to purchase natural gas cheaply, and convert it to blue gas.

"Reformed" natural gas which is becoming more and more important in city gas systems is a cracked gas, obtained by some form of pyrolysis.

Other gases which may be formed in the pyrolysis of natural gas (temperature and catalysts being important factors) are acetylene, butadiene, ethylene, propylene, and butylene. Acetylene is used in welding and cutting metal and in the manufacture of acetaldehyde, which is further used in silvering mirrors or in the preparation of medicinals such as chloral, a soporific. Butadiene under proper treatment condenses to form an artificial rubber having the same general composition as natural rubber. Ethylene has recently come into use in the ripening of fruits and as an anesthetic. However, its major use at present is in the synthesis of ethylene glycol, an excellent anti-freeze for water-cooled motors. Ethylene also is the basis for a series of important lacquer solvents. If desired, ethyl alcohol, widely used as a solvent and in the preparation of such compounds as ether, may be prepared from ethylene. Again, by the proper reaction with chlorine, ethylene chloride is formed. This is a valuable solvent, especially for fats and essential oils, and is also used as an anesthetic. Propylene finds use as an anesthetic, and also in the synthesis of isopropyl alcohol, which is being substituted for ethyl alcohol with good results in some cases. Butylene is also used in the preparation of certain butyl alcohols which are being used as solvents in the chemical industries.

The principal liquids which may be formed in the pyrolysis of natural gas hydrocarbons are benzene, toluene, and xylene. Benzene is a valuable product and forms the basis of many of our chemical processes. Thus aniline is obtained and the entire series of aniline dyes, and many explosives, perfumes, and medicinals. In addition benzene is an excellent solvent and anti-knock motor fuel. Toluene is the basis of the familiar T.N.T. (trinitrotoluene), of dyes, and of saccharin, a sugar substitute 400 times as sweet as sugar. Xylene is similarly used in the synthesis of dyes and other products, and also to a large extent as a solvent.

Solids obtainable from pyrolysis are, besides carbon black, chiefly naphthalene and anthracene. Naphthalene is well known as an insecticide in the form of moth balls. It is also the basis for the important indigo dyes. Anthracene is used in the synthesis of alizarin dyestuffs.

Oxidation

The classification given at the beginning of this article tends at times to overlap. For example, partial combustion of natural gas to produce carbon black is a partial oxidation. The previously mentioned steam reaction to produce blue gas is also an oxidation, as typified by the following chemical equation:

$$CH_4 + H_2O \rightarrow CO + 3H_2$$

A similar oxidation is Casales process for hydrogen, using steam and air with hydrocarbon vapors. The utilization of hydrogen has already been discussed.

One notable use of the carbon monoxide-hydrogen mixture (blue gas) deserves mention at this time. It is the Badische process for methanol, operating at high pressures in the presence of a catalyst. Methanol has a very wide use as a solvent, denaturant, and organic intermediate in the formation of other compounds. Other processes based on blue gas are the Fischer for liquid and solid higher hydrocarbons and the Patart organic synthesis for alcohols, acids, esters, and ketones.

With the proper catalysts and under controlled conditions of pressure and temperature, the methane content of natural gas may produce formaldehyde by direct oxidation by oxygen, or oxygen-containing gases such as air or nitrogen dioxide. This is expressed by the chemical equation:

$$CH_4 + O_2 \rightarrow HCHO + H_2O$$

Formaldehyde is a valuable antiseptic and has also, during recent years, become prominent in the synthesis of bakelite.

[5] "Chem. and Met." Jan., 1931, pp. 40-41.

In regard to the partial oxidation of methane, Smith and Milner[6] at the Pittsburgh Experimental Station of the Bureau of Mines have reported on the oxidation of methane in the presence of oxides of nitrogen. Methane from natural gas was used. Complete data on the reaction in small scale glass apparatus was obtained under varying conditions of heating time, temperature, gas composition, and amount of catalyst (using nitric acid vapor, nitrogen dioxide, and nitric oxide). Small additions of the nitrogen oxides had a marked effect. Under the conditions studied, however, any extensive commercial development does not appear feasible.

Chlorination

Chlorination may be applied to any of the constituents of natural gas, although methane is the one generally treated. Chlorine may be applied directly; or in a carrier; or in conjunction with oxygen, air, or ozone. Also, chlorination may follow pyrolysis, as in the preparation of ethylene chloride.

From chlorination of methane may be obtained chloroform, carbon tetrachloride, methyl chloride and methylene chloride. Chloroform is the widely known anesthetic. Carbon tetrachloride is a non-inflammable solvent used in fire extinguishers, and is used medicinally in combatting the hook worm. Methyl chloride is a refrigerant and methylene chloride a solvent.

Recently considerable use has been made of pentanes from natural gas. A notable commercial enterprise of this sort is the plant of the Sharples Solvents Corporation at Belle, W. Va., which obtains high boiling solvents (for lacquer, etc.) from the natural gas pentanes.[7] Amyl alcohols are first obtained from these pentanes by a process of chlorination followed by hydrolysis. The corresponding amyl acetates are then prepared as desired from the alcohols, while small amounts of amylene dichlorides, amylenes, diamylene, and diamyl ether are recovered as by-products.

Another synthesis from pentane is that of caproic acid.[8] Amyl chloride from the Sharples process (loc. cit.) is converted into amyl cyanide, which is then hydrolysed to form caproic acid. Hexylresorcinol, a well-known pharmaceutical is prepared from caproic acid.

In concluding this article, it should be emphasized that not all the possible natural gas products are commercial realities. Data and information has been presented on the better established fields of utilization. References to some of the newer processes may be found only in patent literature; and secrets of operation are being jealously guarded. New applications may be expected to be developed as fresh supplies of natural gas become generally available. These, together with the improvement of processes now in use, may be considered as affording a most promising field for the future.

[6] Ind. and Eng. Chem., April, 1931, pp. 357-359.
[7] Ind. and Eng. Chem., May, 1930, pp. 439-442.
[8] Ind. and Eng. Chem., April, 1931, pp. 352-353.

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Drilling for Gas in Virginia

Drilling for natural gas is now in progress in several points in Southwestern Virginia, a region where in previous years it was not believed gas or oil existed.

Davis Elkins and Associates have a well in production in the western part of Washington County, Virginia, the product being used so far only by the drilling company and by the owner of the farm. According to newspaper reports, the second well in the same general neighborhood shows signs of early results. Former Senator Elkins, of West Virginia, is quoted as being hopeful of significant developments.

Additional locations for tests in other counties in Southwestern Virginia have been made by Benedum & Trees. A drilling outfit has been located on a farm in Buchanan County. The test on a farm on the Guest River, in Charleston District, Wise County, Va., is still "fishing for the bit." A recent news item in "The Oil and Gas Journal" says that the rig is standing for drilling on the Holston River, although work had not then—June 13—been started. Fair progress is also being made, it is reported, on the Pocahontas Collieries Company tract on Long Branch in McDowell County, West Virginia, close to the Virginia line.

Announces Effect Of Gas on Tree Growth

DR. CARL G. DEUBER, assistant professor of plant physiology at Yale University, recently announced the results of research work that he has done in connection with the effects of gas on tree growth. Gas, hitherto thought to be deleterious to growth, has been found by Dr. Deuber to be a valuable stimulant when administered in small doses. Large amounts, however, over a long period of time cause death to the plants, he found. Shade trees, subjected for two days to a mixture of air and gas, the gas comprising one-fifth of the volume, were budding and unfolding leaves in a normal manner within two weeks. Control trees left in the greenhouse opened their buds after six weeks. Dr. Deuber made a series of experiments during February of this year to determine early symptoms that could be associated with gas injury, so that the possibility of applying remedial measures might be investigated. A large number of dormant potted trees of various species of from one to four years old were available in the greenhouses of the Department of Botany. Among other things, Dr. Deuber says, "When the roots of dormant potted red and black oak trees were washed free of soil and sealed in an atmosphere of illuminating gas, with the stems and bodies exposed to the greenhouses, it was found that the bodies were hastened into active growth three or four weeks in advance of control trees, whose roots were sealed in an atmosphere of air."

U. G. I. Celebrates Fifty Years of Service

(Continued from page 285)

well, on moral courage, and on a high sense of civic and social responsibility.

"In the name of the army of men and women who comprise the U. G. I. Family, I ask that you will accept this plaquette of the tablet which has just been unveiled, in token of our admiration and pride in a leadership which has not hesitated to condemn the lapse of business leaders from accepted moral standards, and has fearlessly advocated higher standards of ethics for public utility executives. It will also serve as an expression of our confidence that the ideals and standards of the U. G. I., developed for half a century by your predecessors, will not only be fully supported and sustained by you, but will be advanced from time to time to conform to the highest standards of American business."

Among those who attended the golden anniversary luncheon were:

Africa, Walter M.; Apt, Morris.
Badger, Herbert L.; Bailey, Edward; Bailey, George R.; Bennett, James M.; Bergen, Martin V.; Bertolette, N. B.; Beury, Dr. Charles E.; Blackburn, Clarence E.; Blakeslee, Clarence; Blinn, Charles P., Jr.; Bockius, Morris R.; Bodine, William W.; Bodine, Mrs. William W.; Borie, Beauveau, Jr.; Bracken, Francis B.; Brinley, Charles E.; Brinton, Clarence C.; Brown, Henry I.; Bryans, H. B.
Campbell, C. L.; Caner, Gerald W.; Cassatt, Robert K.; Caven, Frank H.; Chance, Edwin M.; Chewning, W. L.; Clothier, Morris L.; Coe, A. V. R.; Coleman, B. Dawson; Collins, D. J.; Collins, Herman L.; Conner, Owen A.; Cooper, Stuart; Cortelyou, George B.; Costello, John N.; Cox, Edwin R.; Curran, G. W.; Custis, John Trevor.
Dashiell, P. T.; Davis, Charles C.; Day, Mrs. Charles; Dickerman, William C.; Disque, Dr. Robert C.; Dodge, Kern; Douthirt, W. F. Elliott, George W.; Ewing, Charles H.
Fell, E. Lawrence; Foerderer, Percival E.; Forstall, Walton; Forward, Alexander; Frankenfield, David G.; Frazier, Dr. Charles H.; Frick, John A.; Funk, N. E.
Gaddess, Alexander; Gadsden, Philip H.; Ganser, Herbert H.; Gartley, W. H.; Geist, Clarence H.; Gest, William P.; Granger, Albert R.; Green, Phineas T.; Gribbel, John.
Hagedorn, Joseph H.; Hall, Perry E.; Hardt, Walter K.; Harris, Richard S.; Harter, William C.; Hatfield, Dr. Charles J.; Hayward, Dr. Nathan; Henderson, R. M.; Henry, Dr. J. Norman; Herr, Herbert T.; Herrick, Dr. Cheesman A.; Hilleary, Edgar D.; Hofft, Fred B.; Holton, J. S. W.; Hopkins, Johns; Hopkinson, Edward, Jr.; How, Dr. Harold W.; How, Mrs. Harold W.; Huey, Arthur B.; Hunter, C. W.
Iddles, Alfred.
Jackson, A. A.; James, William F.; Janney, Joseph A., Jr.; Janney, Walter C.; Jardine, D. W.; Johnson, Walter H.; Jones, H. Ennis; Jones, Livingston E.
Kelly, Edward A.; Kennedy, M. G.; Kenworthy, Frank L.; Kinnard, Leonard H.; Kirby, Fred M.; Knowlton, Robert H.
Lauer, Conrad N.; Law, William A.; Leidy, Dr. and Mrs. Joseph; Liversidge, Horace P.; Llewellyn, A. J.; Lloyd, Horatio G.; Lloyd, H. Gates, Jr.; Long, Walter E.
McClenahan, Dr. Howard, McKenzie, Dr. R. Tait; Macy, E. C.; Madeira, Percy C.; Martin, John C.; Mason, William Clarke; Meyer, Edward B.; Millar, A. B.; Millar, Preston S.; Moore, J. Hampton; Morgan, Charles E., 3rd; Morgan, F. Corlies; Morgan, Marshall S.; Morris, Effingham B.; Morris, Effingham B., Jr.; Morris, I. W.
Nagle, Charles Thomas; Newbold, Arthur E., Jr.; Newbold, John S.; Newhall, C. Stevenson; Newhall, Thomas, Norris, Warren A.
Oliver, F. M. Milward; Owens, J. F.
Pearson, Joshua Ash; Penniman, Dr. Josiah H.; Philler, William R.; Porter, Edward.
Randolph, Evan; Rebmann, Godfrey R.; Roberts, Percival, Jr.; Robinson, Dwight P.; Roosevelt, Nicholas G.; Roper, William W.; Rush, Benjamin; Rutledge, F. J.
Schauer, Frank; Schutt, H. S.; Scott, Garfield; Seeds, Jacob J.; Senter, Ralph T.; Shearer, J. H.; Sinkler, John P. B.; Smith, A. J.; Smith, R. A. C.; Smyth, David J.; Staples, P. C.; Stern, J. David; Sterrett, H. R.; Stockwell, Joseph F.; Stotesbury, Edward T.; Stroud, Morris W.; Sullivan, R. Livingston; Swift, A. D.
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Van Horn, R. R.; von Moschzisker, Robert.
Wade, William H.; Wakelee, Edmund W.; Warden, Clarence A.; Wayne, Joseph, Jr.; Weadock, Bernard F.; West, C. K.; Woodruff, Clinton Rogers; Whitecar, Fred C.; Whittaker, Frederic S.; Whitwell, George E.; Williams, David E.; Williams, David E., Jr.; Wilson, Thomas W.; Windrim, John T.; Wood, C. B.
Yarnall, Charlton; York, Edward H., Jr.; Young, Percy S.
Zimmermann, John E.; Zimmermann, Mrs. John E.; Zimmermann, R. Z.

New York Mayors Study Public Service Law

THE New York State Conference of Mayors has authorized a comprehensive study of the State Public Service Commission Law and all public utility statutes affecting municipalities. A special committee of five, to be named by Mayor Roesch, of Buffalo, president of the conference, will bring in its report and recommendations to the mid-winter session in Albany.

This is the first attempt in New York to have public utility rates fixed by municipal officials, with the Public Service Commission acting as a court of appeal. The decision was taken at the suggestion of Rosslyn M. Cox, former Mayor of Middletown, and an honorary president of the conference, who proposed a three-fold program for revision of the Public Service Commission statute to restore to local officials a large measure of responsibility for reasonable rates and adequate service. Should the conference look with favor upon the plan, it will be carried to the Legislature next winter, where a determined fight to amend the Public Service Law is forecast. The municipal control idea will be embodied in one of three resolutions aiming at revision of this law. All three were drafted by Dr. John Bauer, public utility consultant of New York. Dr. Bauer said: "This is absolutely the thing to do," and explained that while the idea was unique in the Empire State, it is in successful operation in Iowa, Minnesota and Texas. The resolution would give the companies the right to appeal from the rates fixed, or other action taken by the local authorities, but such appeal would first go to the Commission, which would thus constitute the trial court to pass on the reasonableness of the local action.

Making and Selling Comfort

An effort is being made to have the world drop the term heating contractor for comfort contractor. It is much more appropriate, according to men in the industry, since the introduction of cooling systems. Louis T. Braun, secretary of the Chicago Master Steamfitters' Association, pointed out that refrigeration and heating now have merged and overlap. Mr. Braun said that refrigeration and heating can no longer be separated, and that the heating contractor now must be prepared to handle refrigeration as well as heating. "There is little difference between refrigeration and heating," said Mr. Braun. "One is a process of extracting heat and the other a process of adding heat to air."

A. G. A. Affiliated Associations

How They Started and How They Have Grown

By Wm. H. Thompson
Secretary

THE OHIO GAS AND OIL MEN'S ASSOCIATION

Herewith is the seventh of a series of articles appearing in the "A. G. A. Monthly" giving an outline of the history and accomplishments of State and district utility associations which are affiliated with the American Gas Association. Work of these associations has proved of great value and a distinct contribution to the advancement of the gas industry. It is believed that this series will focus yet greater attention on the splendid records of these organizations.

ON March 13, 1911, The Ohio Gas Association was organized in Columbus, Ohio, and the following men were elected officers:

President, John M. Garard; vice-president, Henry D. Turney, Columbus; secretary-treasurer, T. C. Jones, Delaware.

Executive Committee: Kay C. Krick, L. B. Denning, F. L. Chase, Columbus.

Membership was made up largely of executives of gas companies.

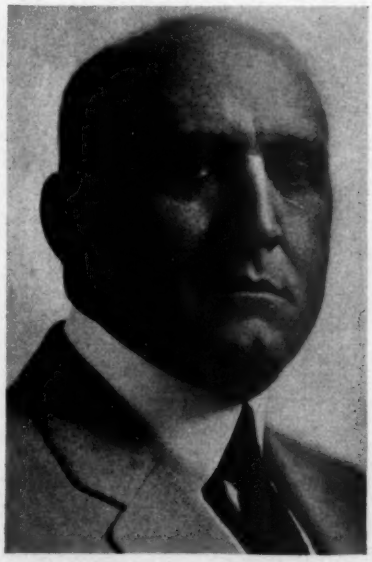
An annual meeting of this association was held in February, 1912, at the Chittenden Hotel, Columbus.

On June 19, 1918, in Columbus, Ohio, was held the organization meeting of this, The Ohio Gas and Oil Men's Association, an outgrowth, in a way, of the old Ohio Gas Association, which for a number of years had been more or less dormant.

Article II of the Constitution and By-laws of the Association, reads as follows:

"This association is formed for the purpose of improving the efficiency and advancing the common welfare of the oil and gas industry, encouraging increased development of these prime essentials and extending their field of usefulness; assisting the United States government in every possible way in procuring the necessities of war; promoting a closer cooperation between men engaged in these industries, advocating equity in business usages and laws, and proper consideration of questions affecting the interests it represents as well as those of the country at large."

The late L. G. Neely, of St. Marys, Ohio, was the first president; H. J. Hoover, Cincinnati, and F. O. Levering, Mt. Vernon, vice-presidents, and Wm. H. Thompson, secretary-treasurer. Directors selected were J. M. Garard, A. F. Holliday, James W. McMahon, Geo. W. Trimble, K. C. Krick, C. W. Sears, Geo. H. Mauntler, J. J. Crawford, M. B. Daly, James E. Campbell, W. E. Sykes and Wm. M. Loar.



L. K. Langdon, president of The Ohio Gas and Oil Men's Association

Offices were opened in the First National Bank Building and almost twenty-three hundred members were enrolled during the first year.

On October 7, 1919, the first convention of the association was held in Columbus, at the Elks' Home, and was a great success, both from point of attendance and program, and since then the conventions of our association are always eagerly looked forward to by the members; they are very well attended, enthusiasm runs high and the programs are unusually well chosen and timely.

It might not be amiss to mention the method of procedure of one of our conventions. The morning of the first day is given over entirely to registration. The afternoon session is short, as the convention resolves itself into sections. There are usually three sections, production of natural gas, distribution of natural gas and public relations. At various times when accounting problems were timely, there was a section on accounting. In these various sectional meetings, problems are taken up and discussed relative to the betterment of the service to the public and the attainment of a higher degree of efficiency in those particular departments of the industry. There is a set program, but the men may deviate from that and are free to ask any questions or bring up any problem for discussion.

In the evening there is a banquet

Shown above, left to right, are William H. Thompson, secretary-treasurer, James Dye, T. C. Jones, past president of the Ohio Association, and Edwin Robinson, secretary of the West Virginia Gas and Oil Men's Association

with entertainment. The following morning there usually is a general session, reports of committees, election of officers, and the meeting adjourns, leaving the afternoon free for the members.

In July, 1919, the association began the publication of *The Ohio Gas and Oil Men's Journal,* a magazine which is sent without cost to all members. *The Journal* is not published for profit, nor is there a paid staff. It is published in the offices of the association and is more or less self-sustaining.

The association keeps in close touch with both the Public Utilities Commission and the Tax Commission of Ohio, as well as watches for any unfair practices that may do harm to both the industries it represents and the public.

In 1922, the association assisted in financing the proposition of investigating the gas content in the coal from the coal fields of Ohio, carried on by Professor D. J. Demorest, of the Ohio State University.

The association, in cooperation with the Electric Light Association was successful in securing a uniform classification of accounts for Ohio utilities before the Public Utilities Commission and the Tax Commission of this State.

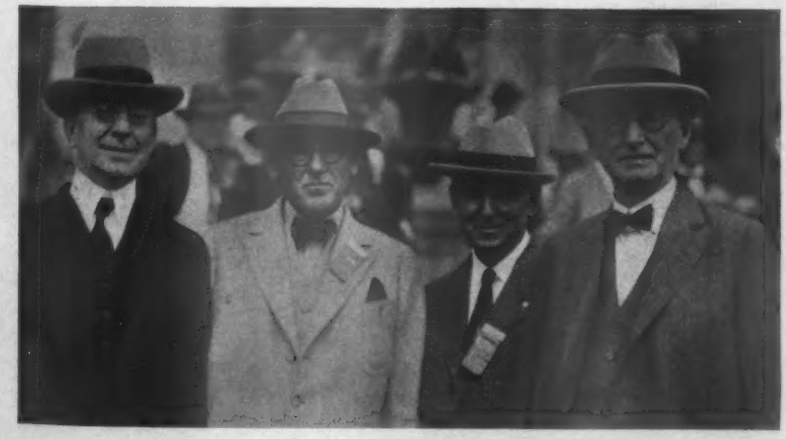
In 1927 the association affiliated with the American Gas Association.

Past presidents are: L. B. Neely, St. Marys, Ohio, deceased; F. O. Levering, Mt. Vernon, deceased; James W. McMahon, Toledo, H. J. Hoover, Cincinnati, T. C. Jones, Delaware, John M. Garard, Columbus, John J. McMahon, Cleveland and L. K. Langdon, Cincinnati.

The association offices in Columbus are open at all times to its members and they are urged to bring their troubles to headquarters.

The present officers of the association are: L. K. Langdon, Cincinnati, president; Raymond Cross, Columbus, and Warren E. Burns, Marietta, vice-presidents; Wm. H. Thompson, Columbus, secretary-treasurer.

Directors: L. A. Seyffert, Joseph Dallow, E. A. Munyan, K. C. Krick, R. W. Gallagher, P. W. Lupher, E. R. Curtin, Jr., James W. McMahon, James Burtner, T. C. Jones, John J. Klise and John J. McMahon.



Herewith are shown L. B. Denning, J. M. Garard, Ira L. Neely and James W. McMahon, all active in the affairs of The Ohio Gas and Oil Men's Association

New Cracking Process Is Developed

A NEW continuous process of cracking and reforming gases which appears to offer attractive economic savings to operating gas utilities has recently been developed.

Raw materials are hydrocarbons, such as natural gas, butane or other liquefied petroleum gases, and water in the form of steam. The transformation or reforming of these materials is accomplished in a high temperature tube furnace containing a catalyst. By varying the proportions of the hydrocarbons and steam, and by maintaining proper operating conditions, a finished gas can be produced of uniform quality and of any desired thermal content within the range of commercial gases.

Philgas officials feel that the low investment cost of the required equipment and the extreme flexibility of the process to produce the exact type of gas needed for any distribution problem will be of financial importance to the gas industry. The ability to duplicate the properties of all commercial gases gives such a process a wide application in supplementing supplies of either natural, manufactured or mixed gas, because it eliminates the necessity of appliance adjustments which would be necessary if a gas of changed specific gravity or calorific value were used. The process is capable of being put into operation on short notice to meet peak load conditions and can also be used to enrich manufactured gas of low B.t.u. content.

One interesting feature of the process is that the total heating value of the finished gases is greater than the heating value of the original hydrocarbons subjected to the cracking and reforming process. This increase in calorific value is explained by the fact that a combustible gas, hydrogen, is obtained from the steam during the reaction.

Gas Used Throughout Ford Finishing Plant

By J. B. Nealey
American Gas Association

ULTRA-MODERN in every respect the assembly plant of the Ford Motor Company, recently erected in Long Beach, California, stands as a model for efficiency in equipment and layout in both the assembly and finishing divisions. Furthermore, it has a pressed steel division, with presses running up to 105 tons, where are stamped out such parts as fenders, fender wells, running boards, dust shields, hoods, etc., to be distributed to all of the assembly plants on the Pacific Coast. The cost of this plant is in excess of $5,000,000.

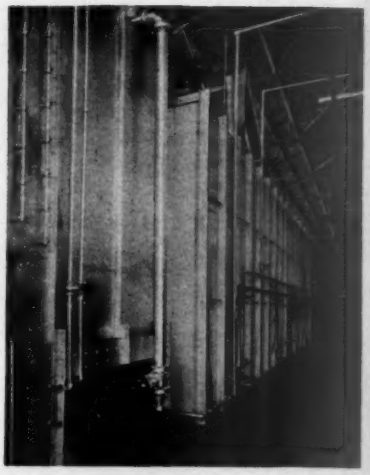
The main building is 387 x 920 ft., fronts on Long Beach harbor and is served by two parallel spurs from a railroad, both of which run along the north side of the building, one outside and one inside. Overhead conveyors distribute stock and parts all over the plant from here. Equipment for finishing, ovens, etc., take up more than half the space in this plant and gas is the fuel used throughout. Fenders, etc., which are to be enameled are first put through a process known as bonderizing which prepares and rustproofs the steel.

Bonderizing consists of putting the steel parts through a solution of manganese phosphate and iron phosphate in water, at a temperature of 210 degress F. A manganese iron phosphate coating is deposited on the steel. The layout for this process is somewhat complicated for the steel parts must be carefully cleaned before bonderizing and then thoroughly dried in a gas-fired oven. This layout takes up a space 32 ft. wide and 136 ft. long, with an overhead chain conveyor moving the parts, continuously and automatically, through the different steps.

The first unit consists of a sheet steel chamber 16 ft. wide and 40 ft. long containing tanks with pressure sprays above them. The first two contain soda solutions and the other fresh water. All are heated with live steam from gas-fired boilers and the solutions and water are pumped through the sprays onto the parts as the conveyor carries them along, the excess running back into the tanks for reuse. The conveyor then enters the bonderizing compartment which is also of sheet steel and is 18 ft. wide, 80 ft. long and 10½ ft. high. The parts enter the bonderizing tank make three passes through same, the time in solution being 10 minutes after which they go through a rinse tank of hot water and then through a drying oven which removes all traces of water. The temperature of this oven is 450-500 degrees F.

The remainder of this setup includes a washer—tank and spray—and an oven 10 ft. wide and 45 ft. long. The oven is the full muffle type and is constructed of sheet steel, heavy insulation and fire brick. The muffle is 8 ft. high and 5 ft. wide and occupies the upper portion of the oven. Below is the combustion chamber into which fire four gas burners from each side, the heat rising up around the muffle. A temperature of 450-500 degrees F. is maintained and a chart kept by a recording pyrometer. There is 60 ft. of conveyor exposed from the exit end of this oven to the entrance end of the washing unit first described, and this is used for loading and unloading the parts. As the parts emerge from the oven they are transferred to a parallel conveyor which takes them to the enameling ovens.

The enameling setup is 380 ft. in length and includes two ovens and two dip tanks, all in one straight line, with a chain conveyor taking the parts through a two coat process, continuously and automatically. Operators load them at one end and remove them at the other with the two coats dipped and baked on. There are three glassed-in enclosures, one at the loading end of the first oven and covering the first dip tank and loading operators, one between the two ovens and enclosing the second dip tank and the third at the unloading end of the second oven and covering the unloading operation. In this way the entire system is sealed off so that no dirt-laden air from outside can penetrate. All fresh air used in this system is forced in through filters.



Gas-fired oven of bonderizing layout, showing end of last washer in foreground

The ovens are of modified A type and each is 143 ft. long. They are heated with separate gas-fired heaters which set under each oven, the hot air being forced into the ovens by fans and through ducts. There are four heaters for each oven and two gas burners for each heater. The oven ducts, one on each side, start at a point 40 ft. from the loading end and extend for 70 ft. inside the oven. They are of sheet steel 12 x 32 inches in cross section, and are placed on the bottom and against the walls and there are openings at intervals for the heat to pass into the oven. These openings have hinged covers so that the flow of heat can be so regulated as to be distributed evenly throughout the oven.

The heaters are of the indirect-fired type in which the products of combustion travel in a circuitous path inside tubes, while the air to be heated is passed over the exterior of the tubes,

the heat being transferred through a large area of fin radiating surface. The shell is built of sheet steel and is insulated to minimize radiation losses.

The fresh air is drawn through a filter to rid it of dirt and dust that might otherwise settle on the parts being enameled.

The temperature in each oven is maintained continuously with an automatic temperature control, equipped with recording pyrometers which keep accurate charts of any heat fluctuations in different parts of the oven. A valve in the gas supply line is kept open, against a spring, by the pressure of gas exerted on a diaphragm, the valve and diaphragm being connected with a stem. A thermostatic valve is opened and closed by the expansion and contraction of a capillary tube which extends into the oven. When the oven becomes too hot the medium expands and the pressure on the diaphragm drops and the flow of gas to the burners is thereby reduced until the oven temperature has dropped to the point set on the regulator, when the reverse action takes place.

While this oven sets on supports about 5 ft. above the floor and resembles closely the A type oven, the legs on each end are hardly more than hoods. From each one of these hoods rises a venturi type stack, a motorized fan forcing air into it, about half way up, through a short length of pipe serving as injector. Both coats are baked on at a preheat of 250 degrees and high heat of 440 degrees F., 45 minutes for each coat.

Alongside this oven is a burn-off oven through which the work is first run to burn off any grease and dirt and in conjunction with this is a washer with tank and sprays. A system of pumps and pipe lines supply paint, enamel, etc., from the storage tanks to all parts of the finishing division and this system is directly connected with the enamel tanks of the ovens just described. In case of fire these tanks are automatically drained in less than 8 minutes. All of the units in the finishing division are served with an automatic fire protection system of the chemical spray type.

The final assembly line is 560 ft. in length and runs at a speed of 140 inches per minute. It requires only 48 minutes to assemble a car complete from the time the chassis is put on the head of the line to the time its tank is filled with gasoline and it is run off under its own power. While the capacity of this plant is being increased it will turn out, at the present time, 400 completed cars and trucks every 8 hours. All of the conveyor lines in this plant feed either directly, or through other lines, onto this final assembly line.

Bonderizing layout. Loading and unloading sections of bonderizing conveyor. Note parts emerging from oven at left and then other parts entering washer in center and operators for handling material to and from conveyor

Gas Corporation Provides Free Picnic Grounds

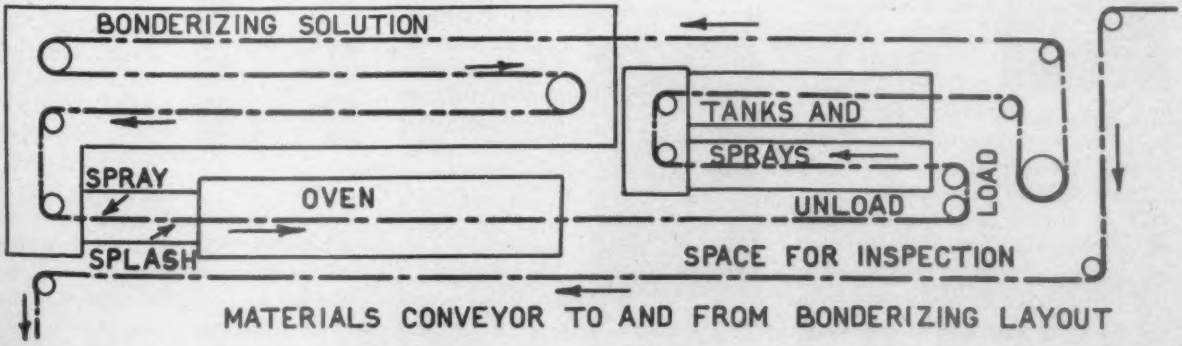
AN outing and picnic grounds dedicated exclusively to use by clubs, churches, fraternal organizations, companies and similar groups has been opened by the Oklahoma Natural Gas Corporation, near Tulsa. It is Settle Station Park, fifteen miles northeast of Tulsa and use of the grounds is free of charge.

Natural features of the park, which in the winter time is a compressor station and plays a vital part in maintaining fuel service in Tulsa, made it easy to adapt for recreational purposes. Its topography is ideal and a natural grove affords plenty of shade for picnics.

A cooling pond, forty by ninety feet, has been converted into a swimming pool. A sand beach was laid and large beach umbrellas were made available. There is also a wading pond for children.

Space for games also is plentiful. There is a plot for playground baseball, horseshoe pitching, croquet, and swings and seesaws have been erected. Parking space is ample and nighttime need not interfere with any outings because the place is covered with lights.

A rock garden and fish pond were recently built and added greatly to the natural beauty of the place. Rock was easily obtained from just outside the premises and beautiful shrubbery also came from near by.



M. L. Sperry Elected Head of Washington Gas Light Co.

MARCY L. SPERRY has been elected president of the Washington Gas Light Company, Washington, D. C., having resigned as vice-president of the Fall River Gas Works Company, Fall River, Massachusetts, in order to accept the post at the National Capital.

M. L. Sperry

Mr. Sperry has spent most of his business life in Savannah, Georgia, and Ponce, Porto Rico. He served as assistant treasurer and afterward manager of the Ponce Electric Company. Later he joined the Minneapolis General Electric Company as General Superintendent in charge of operations and construction. He returned to Savannah as manager of the Savannah Electric Company and for the last few years has been in New England in charge of electric and gas properties, and also electric properties in Porto Rico, Jamaica, B. W. I.

A native of Annapolis, Maryland, and the son of Rear Admiral Charles S. Sperry, U. S. N., Mr. Sperry received his education in the Washington public schools and in 1900 graduated from the Massachusetts Institute of Technology. It was at that time he became associated with Stone and Webster, Inc., and went to Savannah.

McCarter Awards

AT a dinner held at the close of the nineteenth annual meeting of the Eastern Pennsylvania Safety Conference in the Americus Hotel, Allentown, Pa., which was attended by 450 representatives of large industries, newspaper men and regional directors and officials of the conference, four employees of the Pennsylvania Power and Light Company were signally honored for heroic acts performed last summer and fall.

H. E. Scheirer

Herbert E. Scheirer, of Lehighton, was presented with the McCarter Medal and Certificate of the American Gas Association and Albert J. Hebel of the same City the McCarter Certificate for the resuscitation by the Schafer prone pressure method, of Herman Schild, a fellow workman, on August 13, 1931, who was overcome by tar fumes while repairing a blocked main. Dr. J. A. Trexler, who attended the victim, praised both men highly for the ability they showed in putting their company training into practice so efficiently at a moment's notice. The award was made by W. M. Dyatt, manager of the power company's Hazleton Division.

T. H. Dougherty, Jr.

Thomas H. Dougherty, Jr., of Mauch Chunk, was awarded the McCarter Medal and Certificate of the American Gas Association and John H. Wertman received the McCarter Certificate for saving the life of Joseph Schaff, a fellow workman on October 31, 1931, by means of the prone pressure method of resuscitation, when overcome by gas while laying a section of pipe. The quick thinking and immediate action of these men in this emergency won the commendation of Dr. J. E. Wasser who attended Schaff. William Long, commercial manager of the Pottsville Division of the Pennsylvania Power & Light Company, made the presentation.

J. G. Shilts

John G. Shilts, a lineman of the Central Illinois Public Service Company, Paxton, Illinois, received a McCarter Medal because of his efforts in saving the life of a woman who had been overcome by gas. R. H. Thompson, division manager at Paxton, made the presentation at a meeting attended by about seventy-five employees.

Alvin M. Brown

In a complimentary manner, the Gasco Club, Lancaster District of The Ohio Fuel Gas Company, sponsored a meeting in honor of Alvin McKinley Brown, engineer, who had been awarded a McCarter Medal and Certificate for the resuscitation of a fellow employee, who had been overcome while at work in the replacement of valves in a compressor cylinder.

H. J. Freudenvoll

A McCarter Medal was bestowed upon Henry J. Freudenvoll, gas fitter, at an executive meeting of the Associated Gas & Electric System, Rochester, N. Y., who was thus honored for saving the life of a member of the Country Club of Rochester who had been overcome by gas. The presentation was made by Herman Russell, president.

J. P. Smith

John P. Smith, pipe fitter employed by the Public Service Corporation of New Jersey, was given a McCarter Medal for the successful application of the prone pressure method of resuscitation upon a man who had been overcome by gas at his home in Irvington, N. J. Before a large group of employees the presentation was made by John M. Orts, director of safety education.

John Michels

At a meeting of officers and employees of the Western United Gas and Electric Company, Aurora, Illinois, a McCarter Medal was presented to John Michels, fitter, by J. F. Egloff, vice-president. Mr. Michels saved the life of a woman who had been asphyxiated.

John Margicin

By saving the life of a victim of asphyxiation through the use of the prone pressure method of resuscitation, John J. Margicin, of Trenton, N. J., employed as a fitter by the Public Service Electric and Gas Company was honored with a McCarter Medal.

Nick Nardoni

Nick Nardoni, a laborer of the Public Service Company of Northern Illinois, was presented with a McCarter Medal for saving the life of a fellow employee who had been overcome while at work making a service tap in Chicago Heights, Ill. The presentation was made by Joe Simmerling, service manager, at a safety meeting attended by all foremen and department heads of the district.

Martin J. Clarke, a reserve policeman and also employed as a fitter in the gas shop, received a McCarter Medal at a meeting of employees of the Lawrence Gas and Electric Company, Lawrence, Mass., who saved the life of a woman who was found unconscious in a gas-filled room.

Brooklyn Polytechnic Gas Engineering Course Enters Upon Sixth Year

Industrial Gas Laboratory at the Polytechnic Institute of Brooklyn

THE completion of the gas engineering course by the fifth class last May brings the total number of gas company employees to successfully pass the requirements to 190 at the Polytechnic Institute of Brooklyn. These men are now equipped with a better understanding of the gas business in all its branches and a clearer understanding of their own job and its relation to that of their fellow workers with the consequent broader and more comprehensive outlook which is of prime importance for satisfaction and advancement.

The sixth year of the course will start on September 29 with the same general purpose which the past has proven to be sound. The material of the course is arranged and scheduled primarily to lay before the student, in logical sequence, the general principles involved in the manufacture, distribution and utilization of gas. The subject matter of the course is presented in a series of twenty-six lectures delivered by men of long experience in their respective fields. Lectures are given in the physical and chemical properties of gases; the manufacture and purification of coal and water gas and a study of the equipment involved; distribution system, design, operation and maintenance; gas measurement; the chemistry of combustion; industrial furnace types and control of combustion; domestic appliances and gas company organization and public relations. These lectures are supplemented by timely inspection trips to gas plants and manufacturing plants using gas in production work.

Twenty-two laboratory sessions of two and one-half hours' duration each are scheduled in conjunction with the lectures. The purpose of this portion of the course is to "drive home" the fundamentals of chemistry and physics as applied in the gas industry by means of actual experimental study. The last seven sessions of laboratory work are concerned with the utilization of manufactured gas and includes such interesting studies as gas furnace manipulation and testing, explanation and test of a gas-fired refrigerator unit and other experiments equally instructive.

The class which just completed the course was fortunate to have the opportunity to listen to a most instructive lecture on the subject of "Public Relations" delivered by Clifford E. Paige, vice-president of the Brooklyn Union Gas Company.

This course is given during the evening and is open to employees of gas companies and related industries who have had the equivalent of high school training in chemistry, physics and algebra. Application and any information regarding the course may be obtained from Professor E. F. Church, Jr., head of the Department of Mechanical Engineering, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn, N. Y.

Affiliated Association Activities

Southern Gas Association

S. L. Drumm

THE first Executive Committee meeting of the Southern Gas Association was held in Memphis, Tennessee, June 1, 1932. The session was unusually well attended, and there was a noticeable air of activity and increased interest in the work of the Southern Gas Association.

President J. J. Brennan outlined a constructive plan of procedure for the fiscal year 1932-1933. He also appointed, at this time, the committees which will carry on this work.

On the recommendation of the retiring president, E. N. Avegno, one of the major activities to be carried on by the association during this year will be a closer cooperation with the dealers. This work will be carried on by a Trade Relations Committee to be appointed at a later date by Mr. Brennan.

S. L. Drumm, of the New Orleans Public Service, Inc., New Orleans, La., has been elected secretary-treasurer of the Southern Gas Association.

Pacific Coast Gas Association

THIS year the Pacific Coast Gas Association will hold its thirty-ninth annual convention in the West's famous resort, Hotel Del Monte on the Monterey Peninsula. Hotel Del Monte lies about 140 miles south of San Francisco and its surroundings are of interest both scenically and historically.

The association this year has fifty committees which are now actively engaged in perfecting plans for a notable convention program. The deep interest this year in solving the problems of competition and of business development in the face of depression is expected to make this convention one of the most important in the history of the Pacific Coast Gas Association.

Business meetings will be confined to three days, August 24, 25 and 26, inclusive. These three days will be filled with serious and thoughtful discussions of the problems of the gas industry, which for the past year has been active with some of the most intensive advertising and sales plans in its history.

President James L. Stone has appointed T. W. Snell as general convention chairman. Mr. Snell is division manager of the Coast Valleys Division, Pacific Gas and Electric Company, with headquarters at Salinas. His familiarity with conventions in general and Del Monte conventions in particular promises a well-managed and most enjoyable affair.

Convention Calendar

July

5-22 Household Gas Appliance Course
Columbia University, New York, N. Y.

August

22-25 American Chemical Society
Denver, Colo.

24-26 Pacific Coast Gas Association
Del Monte, Calif.

25-26 Wisconsin Utilities Association, Commercial Section
Eau Claire, Wisc.

September

14-16 National Petroleum Association
Atlantic City, N. J.

15-17 American Trade Association Executives
Atlantic City, N. J.

October

3- 5 American Society Testing Materials
Buffalo, N. Y.

3- 7 National Safety Council Congress
Washington, D. C.

4- 5 Indiana Gas Association
French Lick, Ind.

10-14 AMERICAN GAS ASSOCIATION
Atlantic City, N. J.

November

1- 2 Institution of Gas Engineers
Annual Research Meeting, London, England

15-17 American Petroleum Institute
Houston, Texas

Wisconsin Utilities Association Meets August 25

REAL progress is being made both with the program and with general arrangements for the Commercial Section Conference of the Wisconsin Utilities Association to be held in Eau Claire August 25 and 26. Several vital subjects such as competition, relations with other dealers, advertising problems, merchandise accounting, rural extension, sales methods and general matters affecting the industry will all be presented. Members are urged to plan now to be present. Near-by hydro-electric power plants undoubtedly will be of interest. The trip will fit in well with vacation plans in the northern part of the state or a trip into Minnesota. The Hotel Eau Claire will be headquarters. Executive Secretary Cadby is advising early reservations be made.

R. O. Jasperson

Associate members are being circularized as to the desirability of holding an exhibit in connection with the convention. The Northern States Power Company will be host.

R. O. Jasperson is chairman of the Commercial Section.

Canadian Gas Association

HUGH McNAIR, manager gas utility, Winnipeg Electric Company, Winnipeg, Manitoba, was re-elected president of the Canadian Gas Association for the year 1932-1933, at the annual meeting held in Winnipeg, June 9 and 10.

Notwithstanding the distance Winnipeg is situated from most of the Canadian gas centres, the attendance was good. There was also in attendance many persons from the United States, the American Gas Association, being represented by Major Alexander Forward, managing director, and R. M. Conner, director of the Testing Laboratory, Cleveland.

At the annual banquet, held in the Fort Garry Hotel, Major Forward brought greetings and best wishes from the American Gas Association, while Arthur H. Lymn, of London, England, extended best wishes from the British Society of Gas Industries. Telegrams were read from various prominent men, including President Canning, of the Institution of Gas Engineers, London, England.

Ladies attending were entertained with a sight-seeing trip to the Lower Fort Garry Country Club, where an inspection was made of the original old fort of the Hudson Bay Company, built two centuries ago. Delegates enjoyed a trip to the large coking plant of the Winnipeg Electric Company.

Officers and directors were elected as follows:

President, Hugh McNair, manager gas utility, Winnipeg Electric Company, Winnipeg, Manitoba; vice-president, Donald G. Munroe, vice-president and managing director, Montreal Coke & Mfg. Co., Montreal, Que.; second vice-president, J. C. Dawson, assistant superintendent gas department, Quebec Power Co., Quebec City;

Members and guests at Canadian Gas Association Convention, Winnepeg, June 9-10

secretary-treasurer, G. W. Allen, industrial survey engineer, Toronto, Ontario.

Executive Committee—Arthur Hewitt, vice-president and general manager, Consumers' Gas Co., Toronto, Ontario; J. S. Norris, vice-president and managing director, Montreal Light, Heat & Power Con., Montreal, Que.; C. A. Jefferis, works superintendent, Consumers' Gas Co., Toronto, Ontario; J. M. H. Young, superintendent, City Gas Company, London, Ontario; H. S. Williams, superintendent gas department, Guelph, Ontario; V. S. McIntyre, manager, Public Utilities Commission, Kitchener, Ontario; Col. D. R. Street, general manager, Ottawa Gas Co., Ottawa, Ontario; Major J. J. Humphreys, chief engineer gas department, Montreal Light, Heat & Power Con., Montreal, Que.

Hugh McNair

Gas Company Emergency Crew Dons Identifying Uniforms

Emergency crew of The Laclede Gas Light Company. Left to right—August Beckemeyer, Ray Evans, Thomas Morley, John C. Davis, Andy Day, Herman Berendes and John Lee

THE Laclede Gas Light Company, St. Louis, Missouri, has equipped its emergency crew with identifying jackets and caps, recognizing the value of quick identification at times when minutes mean lives. Also, according to E. P. Gosling, president of the Laclede Company, the new uniform is recognition of dependable and efficient work the Laclede emergency crew is doing.

The jackets are olive drab whipcord and across the left pocket in red letters, are the words, "Laclede Service." Caps are similar to army officers' and bear a "Laclede Service" shield.

The Laclede crew is one of the pioneers in the use of the prone pressure method of resuscitation. They aided in organizing similar crews within the police and fire departments of St. Louis and work in close cooperation with these organizations. When summoned to the scene of an accident, they travel in a fast, new car, equipped with a fire bell and further identified by the words "Emergency Service—The Laclede Gas Light Company."

Accounting Section

Wm. A. DOERING, Chairman — H. W. HARTMAN, Secretary — J. M. ROBERTS, Vice-Chairman

Stub Plan of Customers' Accounting As Practiced by Boston Consolidated Gas Company

By W. E. Scott

Superintendent of Customers' Accounting Division
Boston Consolidated Gas Company

AS a result of known differences existing between companies in their bookkeeping methods under the Simplified or Stub System, it may be of interest to present an outline of the practices as followed by The Boston Consolidated Gas Company.

It is generally recognized that the underlying principles followed by each company operating this system are similar, the differences existing being chiefly due to the problems and varying conditions under which each operate.

The Customers' Accounting Department of this company is organized under three groups—the Addressograph, billing, and bookkeeping. The Addressograph Department addressographs bills and maintains plates for each meter that is installed. The Billing Department prepares bills from the meter books on the new type Burroughs High Speed Style 26-17-00 Billing Machines. The Bookkeeping Department takes care of all other activities pertaining to customers' accounts.

When the Stub System was first installed extensive experiments were conducted over a long period to determine which of the following plans, "The Unit" or "Individual," best suited our requirements, resulting in the choice of the latter.

Under this plan accounts are distributed in districts or ledgers with an average of 6000 accounts each. Each ledger is in charge of a bookkeeper who is responsible for all activities pertaining to the accounts in their care. The duties mainly consist of:

1. Post cash.
2. Audit meter books (subtractions of readings are made by meter readers).
3. Post arrears to meter-reading book.
4. Check bills to meter-reading book.
5. Prove billing and enter sales on revenue sheet.
6. Balance ledgers.
7. Post meter orders (on, off, set, and remove).
8. Prepare information for final bills and enter sales on revenue sheet.
9. Transfer accounts (one address to another).
10. Make transcripts of accounts for other departments.
11. Record deposits and allow interest when due.
12. Supply credit information.
13. Supply service department with meter numbers for turning on and off.
14. Supply other departments and offices with any general information desired.

The equipment used for each district or ledger consists of a stock fireproof Safe File capable of housing the meter books of the district together with the stubs of a current month, as well as the stubs of six months previous. Illustrations of these safe files are shown on Exhibit I.

The construction of the top drawer is such that all available space is utilized and consists of a drawer within a drawer, each slide-operated and having three partitions running from front to back, providing four troughs each for the filing of stubs.

The middle drawer is partitioned crosswise. The cross sections are notched at half-inch intervals to allow the insertion at right angles of adjustable slides, thereby creating individual receptacles that not only provide a place for each meter book but keep them standing in an upright manner.

The lower drawer is similar in construction to that at the top, with the exception that the lower or main drawer section is not partitioned, thus affording storage space for other material and records.

Stubs of a current month are kept in the left-hand side of the lower section of the top drawer. The balance of the space in this section, together with the entire space of the top section, is reserved for the stubs of previous months; and in some cases it is also necessary to utilize the left-hand trough of the upper section of the bottom drawer for this same purpose. The remaining troughs of this section are reserved for the cash coupons of the current and previous month.

The route stubs of a current month are protected against wear and tear by utilizing pressboard fronts and fibre backs identical in construction and size to the coupons. The fibre backs are provided with metal-slotted tabs in which is inserted a typed slip, designating the route number together with the first and last ledger folios. To keep the current month stubs intact, Dennison's No. 27-R round head metal paper fasteners are inserted through the punched holes of the pressboard fronts, fibre backs, and stubs, and are not again removed until the next cycle-balance period except to add coupons for additional finals or pick-up sales. See Exhibit II of front, back, and fasteners.

The previous six months' stubs are filed by routes, each route being kept together and always filed so that the last month is in front.

At the close of each day the cashier at the main office forwards to a night force all coupons received by him that day. These coupons are increased in number by others sent direct to the night force by outside stations, and when combined will constitute the entire day's collections.

The routine followed by the night force is:

First, sort the coupons according to ledgers.

Second, list by adding machine the coupons of each ledger.

Third, recapitulate the totals obtained and balance with the figure reported by receiving teller or collector.

This operation is repeated with the coupons of each receiving teller or collector, and after all have been proved the next step is to combine and balance the whole.

First, sort by ledgers.

Second, subdivide ledgers into units or routes.

Third, arrange each route in folio order.

Fourth, make adding-machine listing of each route.

Fifth, recapitulate route totals, obtaining ledger total.

Sixth, wrap listing around cash coupons with total and date showing on top.

Seventh, recapitulate ledger totals for grand total.

The cash coupons and listings are then forwarded to the Bookkeeping Department. As bookkeepers report each morning their first duty is to obtain the cash coupons of their respective ledgers and start to post to the ledger stubs.

Postings are made by using an ordinary rubber-banded dating stamp set so as to print "Paid" and date. The fasteners binding the ledger stubs are not removed. The pressboard fronts previously described being flexible, allow the stubs to be turned back. If a bill is paid in full no further record other than "Paid" and date is made, but should a payment be made on account the amount paid is written in ink after the stamp impression and subtracted from the amount due, showing a new balance.

No reference is made to the adding-machine lists except to verify the first and last coupon of each route and to designate opposite the total the route number.

Route totals are then posted from the adding-machine lists to individual ledger cash

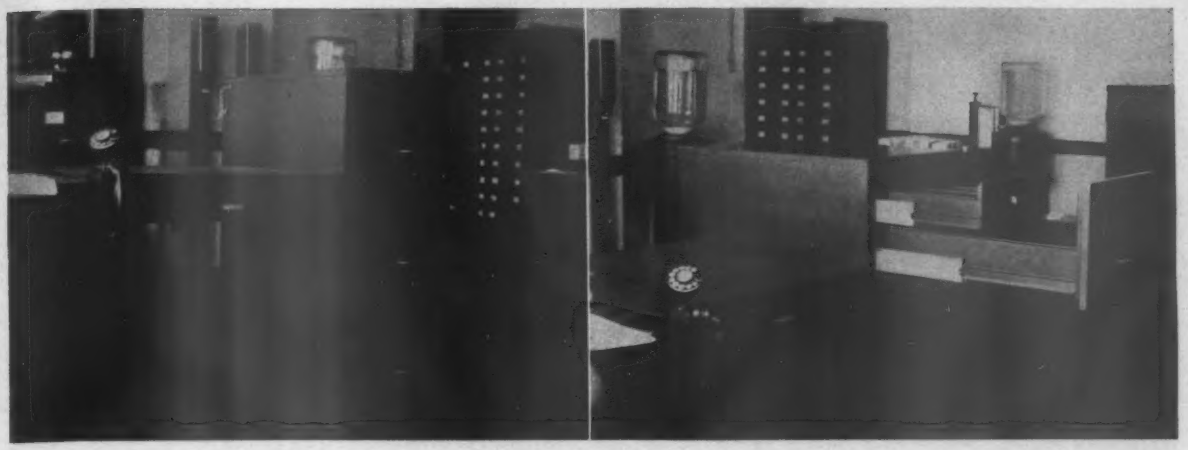


Exhibit I

sheets. A report of the total posted to each ledger is made by bookkeepers to a cash-control clerk who, in turn, combines the reported postings and compares the result with a predetermined total compiled by the Cashier's Department.

After daily postings have been made no effort is made to attempt a proof, as experience has shown that at the end of each cycle period the majority of the routes will balance; but should difficulty be experienced with a particular one, it is much simpler to verify the postings of that route than to devote a lot of time daily in attempting a general proof of the whole.

It must be borne in mind that errors, if any, in individual routes are discovered at the cycle-balance period and must be located in order that the route be in absolute balance before the new bills are rendered.

When experiments were first made with the Simplified or Stub System the removal each day from the outstanding units of all accounts paid in full was considered of paramount importance. The removal of these paid coupons was directly responsible for a condition that soon became intolerable insofar as quick reference to records was concerned, for, as a convenience at the end of the month when balancing, the "pull-outs" of a current month were kept separate until all units were balanced. They were then filed with those of previous months; thus, when it became necessary to trace or refer to an account, a coupon sought for could be in any one of four places: The outstanding unit, the current month "pull-outs," the "pull-outs" of previous months, or current month "pull-outs" not yet filed in their proper place. This condition was exasperating, especially when information was required immediately. It also proved an expensive process and required the services of additional clerks for filing purposes.

When the cycle method of balancing was adopted it was decided not to pull these paid coupons until the cycle balance period. This did away with the filing process entirely, left the units intact, was of inestimable value inasmuch as the records were complete in detail concerning everything that had taken place within them since the previous cycle period, greatly reduced the time formerly spent in locating accounts, and practically eliminated all confusion.

It was also demonstrated that very little of our trouble was occasioned by cash being posted incorrectly or not at all, although sometimes oversights in this connection did occur. Generally speaking, errors were usually found in either the sales, transfers between ledgers, or other debit and credit items. In the event that a proof of cash postings of a route becomes necessary it is a simple matter to list these credits from the stubs and compare the total with that as reflected by the cash sheet. Then, if it does not agree, credits can be taken off in columns, by days, and the daily totals compared, usually resulting in the trouble being confined to the postings of one particular day.

There is, however, one outstanding possibility that even after a route balances and is apparently correct that an error in posting may exist and can be occasioned by a posting for one customer being applied to the account of another. As mentioned before, this is a possibility and occasionally occurs,

Exhibit II

but the same condition not only existed but occurred in other systems; therefore, the Stub Plan offers no more possibilities for this than other systems did.

Meter route books read the previous day are delivered each morning to the Customers' Accounting Department where distribution is made to the proper bookkeepers. After all cash is posted, the bookkeeper's next duty is to complete all unfinished meter orders pertaining to the route book just received; this to be followed by an audit of the meter reader's subtraction, at which time all unusual increases or decreases in consumption are noted, orders made for verification if necessary, and record made on meter sheet. Amounts to be credited customers' accounts covering interest on deposit, fast meter rebate, etc. are also entered on meter sheet at this time. (Under Massachusetts law, interest on customers' deposits must be paid each year.)

Ledger stubs of the route to be balanced are next taken and the fastener removed. Each coupon is scrutinized, accounts paid in full are passed over, and as unpaid stubs are encountered those covering unpaid final bills are removed and segregated, while those representing unpaid open accounts are stamped "Transferred" and date. Stubs so stamped are not removed but left in place with the paid coupons, the amounts having been carried forward on the proper meter sheet, in the arrears column.

No exception is made of open accounts where there are balances due and where it has been impossible to read the meters. Such balances are transferred and will appear on the new bill as arrears. This is done in order that there be a record on the new or current month's stub, but care is exercised that these bills are not forwarded to customers. The route books are held, and late that afternoon all pick-up readings are entered. Then first thing next morning they are dispatched to the Billing Department.

Ledger routes are balanced when outstandings are at the low point. Before a balance is possible, two adding-machine

listings are taken; one of the unpaid final bills, the other of the arrears or balances transferred. The combined total will represent the outstandings in the route. Separate totals are necessary in order that a figure of the arrears be obtained which is later checked to a total compiled by the billing machines.

Debit items used in balancing will consist of amounts of previous outstandings, sales, and other debits. Credit items consist of cash and other credits. The difference between the totals of these items will prove to the outstanding figure.

The balance is taken while route books are in the process of billing; when books and bills are returned completed to the bookkeepers, the arrears' total as reflected on the billing-machine abstract is compared with the predetermined total used as part of the outstandings in the balance. Bills are next audited, and during this process notations taken from the meter readers' route books are made on the ledger stubs of all unread meters, as to why readings were not obtained. When the audit is complete, the ledger stubs are separated from the bills and combined with the stubs of the unpaid final bills previously removed from the old unit. The combined stubs are next placed between the pressboard front and fibre back, the whole to be held together by the metal fastener.

Stubs of all months other than current are kept intact by utilizing rubber bands. The records of fourteen (14) months are kept at the main office building, six (6) months in the ledgers, and eight (8) in steel files located in the Filing Department which is in close proximity to the Bookkeeping Department. Every other month two (2) months' records are shipped in specially partitioned wooden boxes from the Filing Department to the Old Records Department, there to be preserved for seven years.

Application cards are an important factor in the functioning of this department. A card is issued to cover each new and transferred account and is forwarded to the bookkeepers to be held by them until executed meter orders are received. Bookkeepers match each executed "On" or "Set" order with the proper application card, and as these orders are posted the customer's name, deposit and number, if any, are recorded on meter reader's sheet from the card. At the same time, the following notations are made on the application cards: Route, folio, meter size, number, and location. They are then dispatched to the Addressograph Department, and from them the necessary information is transcribed to the addressograph plates.

When the system was first started no provision was made for the recording of information other than the meter book; consequently, when it was out of the department, vital information required could not be obtained, therefore ways and means had to be devised to overcome this objection. This was accomplished by having:

1. Meter numbers carried on the addressograph plates;
2. Current meter readings printed on the ledger stubs at time of billing;
3. Notations, made on stubs having no current bill and which show arrears, as to why meter was not read, i.e., "Out," "Away," "Sickness."

With the above noted in detail on the stubs, bookkeepers are prepared to furnish immediately any and all information desired.

FOR $5.00

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Gas—The Fuel for the Machine-Made House

By R. E. Haas

General Manager, Bowser Service Corp.

GAS will play a leading part in a new industry—the ready-made, multiply-produced small house of the future.

Recently, a Forum on Small Homes was held in New York under the auspices of the American Institute of Steel Construction, when experts gathered to present their ideas on an economical, satisfactory and attractive machine-made house of six rooms or less. The ideas presented at this Forum will be coordinated and a set of specifications drawn up for such a house by a special committee.

Many speakers voiced the opinion that the production of such tailor-made houses will be the new industry that will bring us out of this depression. The expansion of our railroads pulled us out of one depression. The automobile was responsible for another business revival. The radio started still another cycle of business recovery. And now it is the small house movement that seems destined to start the wheels of industry in this decade.

It is the hope of the Forum to pave the way for the manufacture of houses for families with incomes of $2500 or less. Under a system of mass production fully-equipped homes should be available for $5000 and up.

As one speaker asserted, "the factory built house will tend to create prosperity, as every time the price of an article is reduced a new strata of potential buyers is tapped and that less money invested in homes means the home owner can invest more money in other things."

Yearly Demand for Houses

"America needs 780,000 homes a year," according to the estimate prepared by the Carnegie Steel Corporation. Apartments reduce the number of individual homes to 300,000.

During the last six years only 151,000 homes have been built, indicating the urgent need of building now.

The problem has yet to be solved of preserving individuality of the ready-made, multiply-produced small house of the future, while turning out dwellings at minimum cost.

To know what type of house to build is to first know what the woman, who will take care of and live in that house, wants. Women home experts were called into this Forum to tell the designers of the demands of the average homemaker of today.

The mechanical side of housekeeping is uppermost in every woman's mind and the form and arrangement, which the small house of the future may take, will be largely determined by the mechanical equipment women want.

Mrs. Bernice Bowser was invited to discuss the "Mechanics of Housekeeping," which was really a discussion of gas service and modern automatic gas appliances. Incidently, this discussion was the only one touching on gas service.

This subject in particular and the Small House Project in general should command the attention and interest of every one connected with a gas utility, for the gas industry is destined to be an indispensible factor in the fabrication of the materials, whatever they be ultimately, for the machine-made house and in the mechanical side of housekeeping in these homes. In fact, the gas industry makes the small, inexpensive house possible.

Because of the importance of this subject and for a clear understanding of the mechanical side of housekeeping in the future, excerpts from this discussion at the Small House Forum are presented.

Premise

"I would like to start with the premise that women have been rather bewildered by the array of appliances which have been offered them. Women have been forced to become somewhat mechanically-minded and they now realize that many of the appliances which have been placed on the market are mere gadgets, of more bother than benefit, so that women are slowly acquiring *mechanical discrimination*. Women want all modern appliances which facilitate housekeeping, but they begin to see that mechanization does not mean efficiency.

"I would also ask you men and women to remember that literally millions of the women who will live in your six-room houses of the future are women who have had a few years of business experience. They have learned something about efficiency in office or factory work. They have been forced to think more logically than the woman of the past century. They have been taught to reason. They want to introduce efficiency methods into the household as men have in the factory and office. The mechanical features introduced by energy—gas and electricity which have changed the office and the factory have changed the home also but the fundamentals of housekeeping have not changed much.

"In the old nursery rhyme, Monday was for washing, Tuesday for ironing, Wednesday for mending, Thursday for calling (our old-fashioned homemaker did take one afternoon for herself), Friday was for sweeping and Saturday for cooking. Today, the fundamentals of housekeeping are the same. Washing, ironing, sewing, cleaning and the three square meals must be of prime importance to women. Our six-room house must be built around these functions.

"Today the modern woman is younger in appearance, healthier in body and more alert mentally because of the automatic appliances which stand back of her. The five major appliances are the automatic gas heater, automatic hot water storage supply, automatic refrigeration, the modern range with automatic oven control and automatic laundry equipment. The major appliances are supplemented by other smaller appliances.

Heat

"Let us consider heat first. Women want the furnace problem eliminated. Women want the house heating problem reduced to what lighting has been reduced to. A turn of the switch and you have light, as and when, you want it. Women want gas house heating, which you do not have to order ahead, which you do not pay for until you have used. Women want to set a thermostat and know that they have clean, dependable—and with a properly insulated house—inexpensive heat.

"Consider water. Once running cold water was a luxury, then it became a necessity. Once running hot water was a luxury, today every woman considers hot water, plenty of hot water, day or night, as furnished by an automatic storage supply system a necessity, not a luxury. As gas service costs less, and economy must be a factor, women think of plentiful hot water as being supplied by gas service.

"Both the gas house heater and the automatic storage gas water heater are now made in compact form, with good lines, and can be placed in a small space at the rear of the kitchen, *so that the need of the basement is eliminated.*

"Women are daily recognizing the value of hot water from the health angle in maintaining a high personal cleanliness and in living in immaculately clean quarters. Hot water rather than lukewarm reduces effort in maintaining high cleanliness standards.

"Closely allied to your hot water supply is your laundering problem. Plenty of ever-ready hot water has changed the laundering habits of women. Women change their linen, household and personal, much more often. In the small family women do not collect large piles of soiled linen to be scrubbed on Mondays. They wash and iron a little each day, as they wash their dishes, and there is a small gas dryer for kitchen installation which makes the laundering entirely independent of the weather. Women want deeper sinks in kitchen and in bathrooms—at the right height—so they may wash small articles in both basins, every day in the working week. The small electric washing machines have introduced a new way, and an easy way, of disposing of soiled linen quickly and often. The ironer races through piles of linen doing the work in a quarter of the time. The hand iron has been improved each year so that the new automatic types are easily handled. This means that the big problem of washing and ironing which used to take two days (one third of a week) has been reduced to a minimum. The small house of the future should take care of the small daily washing and recognize that *modern methods have eliminated the need of the laundry.*

Three Square Meals

"The old fashioned three square meals have now been reduced to about two square meals. The morning breakfast is a brief interval, the food, such as it is, is supplied by automatic heat. The children and the men of the household often do not return for luncheon so that only dinner compares with the square meals of earlier days. The preparing of food, however, is still of prime importance. Modern ranges and modern refrigeration have radically changed the technique of cooking. Today we have 15,000,000 women using gas ranges—more women than use all other fuels combined. A large percentage of these women are using antiquated equipment and they all want the last word in modern ranges. They want oven control, temperature control and oven insulation. I am convinced that women want to cook by gas. They instinctively want to see the flame. They want the easy control of gas. They feel that they understand cooking by gas and can depend upon *success* in cooking in the modern way by gas. They know from experience that they can depend upon uninterrupted service. And as it costs less, gas service is logical for cooking in the small house.

"In refrigeration no woman is satisfied today with anything but automatic refrigeration, and here the gas and the electric industries have served magnificently. Women who use gas refrigeration, which is absolutely silent, feel that one less motor-driven appliance is a step forward, when the noise factor is considered. On the other hand, women who have stepped forward from *ice* to electric refrigeration are enthusiastic about that. Both eliminate the need of daily marketing, both save money in food preservation and both cost less than other methods of refrigeration in most communities.

Refuse

"Every thinking woman feels that we have not solved our refuse problem. As long as we use tin cans we have a general problem. Our cities have not satisfactorily gathered the refuse. Our townships have in some cases fared even worse. The small gas-fired incinerator has solved many refuse problems, but I doubt whether it would be wise at this time to consider it for the small six-room house.

"I believe that Time as a Factor is entering women's minds. In the old days women did not think that their time was valuable. They did not feel that the time they saved from routine work could be used in other constructive ways. Women want to save time in every way possible and they are beginning to consider the time factor in floor space. For example, the kitchen is used a certain number of hours each day. The living room is used for about an equal number of hours. The bedroom is used for more hours for sleeping and as women are slowly adopting the French idea of making a bedroom a boudoir, using it during off-sleeping hours, the bedroom has a very heavy time value. Now consider the dining room. How many hours is it used? Let us assume that your six-room house has a dining alcove. Modern kitchen equipment is so well groomed, with good lines and immaculately clean, there is no objection to eating in the dining alcove. Here breakfast is served. In many families the children do not return from school for luncheon and in many families the men of the house lunch elsewhere, so the dining alcove serves for luncheon. Only dinner is served in the dining room. The time factor of the dining room is reduced to one hour. I believe that the six-room house of the future will not have two small rooms, living room and dining room, but will have one spacious room, with one end, adjacent to the kitchen, serving as the dining end.

"May I touch on the time factor in the bathroom? And this is allied to the closet thought. If you separate the toilet from the bathroom proper and give the family what is plainly labelled in the English hotel as the Water Closet you increase tremendously the time factor of the bathroom, at the cost of a little partition and one door. If you go a step further and you add, close to the bath, so as to save in plumbing expense, a closet containing a shower, you practically double the time factor of your bathroom. Your water closet, bathroom and shower may all three be in use at one time.

Utilizing the Roof

"Women during the last two years realize that we are facing a shorter working week, for women and for men. We have a big leisure hour problem. It is necessary for us to find ways and means of spending leisure time in a constructive manner. The play space is very important for health, sanity and happiness. Children as well as adults need to spend time in the open. A safe place is needed. Modern traffic has introduced new problems in taking care of children. The small six-room house of the future may have only one floor, as far as the mechanics of housekeeping go—but even if you have the two-story house, you might use your roof for your recreational open air room. Many of you have seen how they utilize their roof tops with the parapet providing privacy in Palestine, in India, in parts of Africa. Engineers tell me that if gas is used for heating purposes so that your smoke problem is eliminated, there is no technical reason why you should not utilize your roof. The medical profession stresses the value of sunshine bathing. The landscape gardener tells me that you may plant wisteria or honeysuckle on the ground, train it to climb your walls and within two years, you can have a vine covered pargola on your roof. You may plant roof privacy in other words. You may have garden boxes. Dr. E. E. Free who has done so much research on the smoke problem tells me that gas heating today is the only practical, inexpensive, smokeless fuel and that unless gas is used for heating it is impractical to use the roof. Women tell me that safe play space must be provided for the children. It may be that health, exercise and play needs may be met by using the roof in the future. It may be that the roof in the future will help solve the serious leisure hour problem, which has grown out of the mechanical advancement of this era. Certain it is that the secret of success in housing depends upon adjustment to mechanical backgrounds. Personal happiness depends upon the successful solution of the leisure time problem which has been presented by mechanical developments."

Is Named Treasurer

W. J. HIGHTOWER, Charleston, West Virginia, has been promoted to the position of treasurer of the Charleston Group of properties of the Columbia Gas & Electric Corporation. The companies in this group are situated in West Virginia, Kentucky, and Ohio. Mr. Hightower was formerly assistant treasurer and has been connected with the companies since 1914.

Industrial Gas Section

W. F. MILLER, Chairman — C. W. BERGHORN, Secretary

Supplementary Material for the Industrial Gas Bibliography

Important new articles on use of heat in industrial work reported in the magazines listed below:

HEAT TREATMENT OF FERROUS METALS—B

Forging—B-I

Industrial Gas. . A new combination boiler and forge . . . . . Dec. 1931 p. 11
(Steam for forge hammers from forge flue products. Mfd. gas.)

Nitriding—B-IIa

Iron Age. . . . . Shortening the nitriding process . . . . . Feb. 4, 1932 p. 344
(Use of ammonia and nitric oxide mixture.)

Case Hardening—B-V

Heat Treating and Forging. . Development of continuous gas carburizing . . . . . Dec. 1931 p. 1113
(Reactions in various zones of furnace.)

Metal Progress. Continuous carburizing by gas . . . . . Feb. 1932 p. 44
(Description of furnace, operating method.)

Lead Hardening—B-X

American Gas Journal . . . . . Continuous liquid heating solves heat treat production problem for large automobile manufacturer . . Jan. 1932 p. 35

Iron Age . . . . . Production problem solved by continuous liquid heat treatment . . . . . Feb. 18, 1932 p. 444

Miscellaneous—B-XI

Gas Age-Record . . Further developments with the luminous flame burner. May 7, 1932 p. 573-5
(Luminous flame burners displace oil and producer gas in heat treating and enameling furnaces. Nat. gas.)

HEAT TREATMENT OF NON-FERROUS METALS—C

Brass—C-II

Gas Age-Record . . Large scale brass annealing in gas-fired muffles . . . . . Dec. 26, 1931 p. 907-8
(Operating data with manufactured gas. Finish slightly oxidized but pickles readily.)

Industrial Gas. . Large scale brass annealing in gas-fired muffles . . . . . Feb. 1932 p. 21

METAL MELTING—D

Stereotype, Linotype and Monotype—D-II

Industrial Gas. . Redesigned pot improves monotype casting efficiency . . . . . Feb. 1932 p. 15

Galvanizing—D-III

Iron Age. . . . . Electrically heated galvanizing furnace . . . . . Feb. 4, 1932 p. 334
(Consumption of electricity and zinc per unit weight of pipe and wire.)

Miscellaneous—D-XII

Iron Age. . . . . Melting grey iron in the electric furnace . . . . . April 28, 1932 p. 968-70
(Overall costs with electricity.)

INDUSTRIAL STEAM APPLICATIONS—E

Power . . . . . Burning natural gas on off-peak basis . . . . . Feb. 9, 1932 p. 191
(Compares power plant steam boiler performance when fired with coal and natural gas.)

Western Gas. . . Electro-automatic draft control for steam boilers . . . Dec. 1931 p. 23
(Damper position regulated by rate of fuel feeding.)

Western Gas. . . Steam plants for water pumping use (natural) gas . . . . Dec. 1931 p. 31
(Five thousand cubic feet of gas equivalent to one barrel of oil.)

WHOLESALE BAKING—F

Miscellaneous—F-IV

Food Industries. Oven heating characterizes baking industry . . . . . May 1932 p. 163-5
(Special baking methods for sponge crackers and sweet biscuit.)

FOOD PRODUCTS—G

Meat—G-III

Food Industries. Packing house profits depend on efficient use of heat. . . May 1932 p. 168-70
(Steam requirements for process work and building heating 67% of total.)

Candy—G-IV

Food Industries. Candy making requires a wide temperature range . May 1932 p. 171-3
(Technical data on candy making.)

Miscellaneous—G-VI

Food Industries. Science dispels mystery from macaroni drying .....Feb. 1932 p. 48
(Rate of travel of moisture from interior of macaroni mass to surface determines maximum drying rate.)

Food Industries. What heat transfer theory tells in the food plant ..May 1932 p. 155-8
(Overall coefficients of heat transfer for jacketed vessels, evaporators, enamel lined kettles and for the sterilization of canned foods.)

Food Industries. Drying fruits and vegetables with sun or heated air ..May 1932 p. 174-6
(Heat requirements, average costs with fuel oil.)

Food Industries. How the canning industry uses heat .....May 1932 p. 179-82
(Steam requirements for blanching and heating brines and syrups.)

LOW TEMPERATURE BAKING AND DRYING—I

Japanning—I-III

Fuels and Furnaces .....Japanning automobile brake parts in continuous production line. .....Feb. 1932 p. 141
(Recirculating heater. Mfd. gas.)

Industrial Gas..Using natural gas in cleaning and coating stove parts .....Dec. 1931 p. 18
(Air recirculation and indirect heating methods used.)

CERAMICS—J

Terra Cotta, Sewer Tile, Refractories—J-VI

Journal Amer. Ceramic Soc..The use of natural gas in firing structural clay products .....April 1932 p. 261
(Reported gas consumption in many different districts.)

Lists of Building Projects Are Now Available

THE American Gas Association has available to members lists covering the entire building program of the United States Treasury Department as of April 30. These include:

Statement No. 1—Projects completed.

Statement No. 2—Projects under contract, either in whole or in part.

Statement No. 3—Projects where sites have been selected, plans completed: Projects now in specification stage or on the market for bids.

Statement No. 4—Projects where sites have been selected and plans partially completed.

Statement No. 5—Projects where sites have been acquired and plans not yet taken up.

Statement No. 6—Projects where sites have been selected title not yet vested.

Statement No. 7—Projects where sites have been advertised for, examined and are awaiting selection.

Statement No. 8—Projects held for amended legislation or for other reasons.

The Treasury Department has jurisdiction over post offices, court houses, marine hospitals, etc. Copies of these lists may be had on application.

Made District Manager

MILTON KAPP has been made supervisor of district operations of the Oklahoma Natural Gas Corporation. Other appointments made by President E. A. Olsen include the following: John G. Longsdorf, assistant district manager at Oklahoma City; Thomas H. Sterling, district manager at Oklahoma City; C. Harry Sacher, district manager at Enid.

Building Gas Plant to Use Low-Grade Brazilian Fuel

HEREWITH are shown Dr. R. D. Lamil and Edward H. Bauer landing in Rio de Janeiro Harbor on their way to Porto Alegre where they are planning to build a new gas plant designed to use only Brazilian national coal. This is said to be the first gas plant ever designed to use exclusively this low-grade fuel which is found in the lower part of Brazil. The coal deposits there are the largest in South America.

Reed-Lamil retorts are used to process this coal at low temperatures.

Also pictured is the party that welcomed Dr. Lamil and Mr. Bauer. It was composed of the following members, from left to right:

Front row: Sr. Gama, publicity department; Mr. Walthers, materials department; R. G. Barnett, manager, new business, rate and property investigation department; Mrs. Barnett; Edward H. Bauer, engineer in charge of gas and by-products department for all Brazilian properties; Ralph D. Lamil, Universal Process Co., Detroit, Mich. (co-inventor of the Reed-Lamil retorts being erected at Porto Alegre); U. G. Keener, manager, publicity department, Rio; Mrs. Edward H. Bauer; Sr. Matheson, materials department.

Back row: A. L. Wilcox, in charge of engineering department for all Brazilian properties; Mr. Sommers, estimating department; Mr. Tobin, head of materials department.

Publicity and Advertising Section

WILLIAM H. HODGE, Chairman ALLYN B. TUNIS, Secretary HENRY OBERMEYER, Vice-Chairman

Telling Customers How to Get More for Less Money

TO OUR CUSTOMERS:

This leaflet is the first of a series we are going to send with your bill for the next few months. They will suggest ways to use your gas range more efficiently and more *economically*. It will be worth your while to read them all.

MORE EFFICIENT COOKING FOR LESS MONEY

To operate your gas range efficiently and *economically*, all you need do is follow a few simple rules. For example, take the boiling of water. The United States Bureau of Standards made some experiments and came to some interesting conclusions. They found that:

1. With a lid on the utensil, violent boiling (with the gas on full) consumes about nine times more gas than is necessary to maintain gentle boiling.
2. For gentle boiling about five times as much gas is used with the lid off as would be required if a lid were on the utensil.

From this, obviously the economical way is to keep your cooking utensils tightly covered. Not only does this save gas, but it prevents the goodness in the food from escaping, and keeps cooking odors out of your kitchen.

Remember, also, that the temperature of boiling water never goes above 212 degrees Fahrenheit, whether the water is boiling furiously or gently, so that once the water is brought to a boil it can be held at boiling point with the gas turned down.

If you would like other information about operating your gas range, give us a call. Perhaps our home service department can help you.

NEW YORK POWER AND LIGHT

NIAGARA HUDSON

TELEPHONE HUDSON 1400

GETTING THE MOST OUT OF YOUR GAS RANGE

Following these simple suggestions will mean more efficient use of your range, and you will burn *less gas*.

1. Lower the gas flame on the surface burner when the food has started to cook.
2. Don't use the giant burner when the simmer burner will do. It is unnecessary to cook over a flame that is larger than the cooking utensil.
3. Use double and triple pans when possible.
4. Turn off gas before instead of after removing utensil from range.
5. Do not leave a burner lighted because it is to be used again in a few minutes.
6. When a pint of water is enough do not heat a gallon.

Next month's bill insert will give additional hints. Watch for it.

NEW YORK POWER AND LIGHT

NIAGARA HUDSON

TELEPHONE HUDSON 1400

Without benefit of ballyhoo

IN keeping with the times, the New York Power and Light Corporation is helping its customers get more for less money. The company is sending out a series of leaflets with the monthly bills, suggesting ways to use the gas range and other gas appliances more efficiently and more economically.

Typical examples of the leaflets sent out are shown in the illustration herewith. The leaflet is printed on a single sheet of tinted paper, ¾" wide and 8¼" long, and as stated by Victor Starzenski, manager of gas sales, "Under present circumstances we think it desirable to do this constructive work entirely devoid of ballyhoo."

BOOK REVIEWS

Following is a review of four special articles by Litinsky, widely known writer on gas and refractory problems. The four new publications are available from L. Litinsky, Technical Bureau, 6 Thiemstrasse, Leipzig, Germany.

Hochleistungs-Gasmesser. Probleme und Aussichten. (High Capacity Gas Meters. Problems and Progress.) Deals with the load wear, corrosion and valve problems of positive displacement meters operating at high pressures.

Zur Automatisierung der Kokereibetriebskontrolle. (Automatic Coke Oven Operating Controls.) Principally a description of the technical and chemical control methods manufactured by the various German companies.

Restlose Vergasung. (Complete Gasification.) Short article on the German aspects of complete gasification, with particular reference to the problem of peak load gas.

Feuerfeste Anstrichmassen. (High Temperature Ceramic Paints and Washes.) Deals with the physical and chemical properties of various high temperature cements, European as well as American, and then discusses the apparatus used for applying these. This is the longest of the papers and contains a very complete bibliography of the subject.

C. GEORGE SEGELER,
Industrial Engineer

Fall River Wins Plaque

The Fall River Gas Works Company, Fall River, Mass., won a bronze plaque offered by the Massachusetts Safety Council to the winner of the 1931 Inter-Plant Contest, in which 182 Massachusetts companies with 79,000 employees sought to improve their accident records.

Through efficient work on the part of the safety organization of the Fall River company over a period of several years, accidents in 1931 were reduced to a minimum and the company was adjudged the winner in its class.

A. G. A. Course Grads Form Society

An alumni association composed of employees of The Brooklyn Union Gas Company, Brooklyn, N. Y., who have completed the American Gas Association course on Employee-Customer Relations recently was formed. A dinner was attended by members of the first class to complete the course, who met to celebrate the fact that they had received diplomas from the A. G. A.

Peter George Major was elected president of the association. Thomas J. Perry, who supervised the course was named honorary president. Other officers chosen were: Herbert A. Kerrigon, vice-president; Frederick Longman, secretary; Louis Rock, treasurer.

To be eligible for membership, an employee must have received a diploma from the A. G. A. for successful completion of the course. Thirty persons were in the first class.

Technical Section

I. K. PECK, Chairman H. W. HARTMAN, Secretary K. H. CREE, Asst. Secty. J. A. PERRY, Vice-Chairman

Practical Application of the Tetralin Process

By HANS A. POHLE

MORE than four years ago the idea of treating disturbances throughout the entire distribution system from one central point by means of tetralin injections was put into practice in Germany. Since then, the idea has proven successful many times and today there are more than 200 gas works on the continent using the tetralin treatment with excellent results. Enough has been written about the theory of this new process, therefore the following will only give an abstract of the actual workings of the Tetralin Process and the equipment used, based on studies and observations made at several German gas works during the last year.

Properties of Tetralin

In order to be of value as a solvent for deposits, etc., throughout the distribution system, the material used must fulfill the following requirements. Easy solubility of the impurities in the solvent; the saturation pressure of the solvent must not be too low nor too high; the congelation point of the solvent must be very low; reasonable cost of the same.

The substance Tetrahydronaphthalene, known as Tetralin, fulfills these requirements best.

Tetralin is a colorless, easily mobile liquid with a specific gravity of 0.9725 at 60° F. and a boiling point of 404° F. It is hydro-genated naphthalene ($C_{10}H_{12}$) and as may be expected from the close relation it bears to naphthalene, possesses the property of dissolving large quantities of it. At 60° F. for instance, 80 parts of tetralin will readily absorb 20 parts of naphthalene, thus forming a 20 per cent solution.

Action of Tetralin

Thorough studies have been made on the actions of tetralin. In brief, the following results have been obtained:

Tetralin dissolves anything of aromatic character; it will not dissolve matter of asphaltic character. It will not dissolve asphaltum, but it will dissolve all resinous and gummy compounds. In other words, that which comes from the gas itself will be dissolved; that which has been placed into the distribution system in form of building material or paint will not be dissolved. Rust in the pipes has a strong tendency to absorb tetralin, the latter penetrates and moistens it throughout, loosening it and eventually carrying it along into the drips. Free iron surfaces will be covered with a thin film of tetralin and therefore protected by its lubricating action. Leather is made soft and pliable by tetralin.

Development of the Tetralin Process

The basic idea of the tetralin process consists in treating the gas not with the liquid itself but with tetral vapors. The gas is made to absorb a certain quantity of tetralin before it enters the distribution mains and only a small amount is required for this purpose.

Brégeat (U. S. Pat. 1513153) proposed several years ago to use tetralin instead of oil for washing the gas in order to obtain more benzol. This idea was carried out in a small German gas works and the observations made there led to the development of the tetralin treatment as it is applied today. It was found that part of the tetralin used for the washing evaporated under ordinary temperatures and this vapor was carried into the distribution system by the gas. This was at first considered an economical disadvantage of the tetralin washing method but after a very short time the important discovery was made that naphthalene deposits, which had caused considerable trouble in the distribution system of this gas works, had disappeared completely. The same thing happened to tar deposits in the mains. An investigation showed that both naphthalene and tar had been dissolved by the tetralin vapors and carried into the drips, while the inside of the pipes was covered with a thin film of tetralin which prevented the formation of rust and dust.

These interesting results were checked by laboratory experiments and the great value of tetralin as a solvent was recognized. It was then decided to separate the benzol washing process from the process of cleaning the distribution system with the aid of tetralin. It was necessary to develop an apparatus, which would inject the correct amount of tetralin into the gas in order to carry out this new treatment on an economic basis. The quantity of this liquid as picked up by the gas from an ordinary washing tank would be much too large and could not be regulated according to need. A treatment of that sort would be inefficient and far too expensive.

In Germany, two methods were developed for the successful application of the tetralin process by the Maschinen-und Apparatebau Gesellschaft Martini & Hueneke, Berlin. In the first process, the tetralin is converted into vapor form with the aid of heat from electric units, while in the second case—the so-called "cold process"—the tetralin is forced through the injector where it is transformed to fog of such fine quality that the individual particles are quickly vaporized by absorbing heat from the gas. The apparatus, as well as the entire process, is protected by patent rights.

Tetralin Vaporizers

Tetralin vaporizers are built in different sizes for various performances. The vaporizer can be put into service whenever needed until all old deposits have been dissolved, or can be used continuously to keep the distribution system free from naphthalene, tar, gum, rust and flying dust. Practical experience has shown that it is advisable to use tetralin continuously but to reduce the quantity to a minimum during the summer months. When interrupting the treatment, the same old disturbances that were present before the introduction of the treatment will have a chance to develop again and the good effects of the careful treatment might be lost. A feature of the process is that the injections are not made in a forcible manner which might be harmful to the gas distribution but in the form of an easy, deliberate treatment which brings results step-by-step. If the treatment is interrupted, it will be necessary to start with larger quantities of tetralin again when resuming the treatment. However, the use of portable tetralin vaporizers is recommended in cases where quick results are required when obstinate deposits form hazards in the mains. These compact units may be installed at places where the trouble is most apparent and left until it has been remedied, then they may be moved to another place. In this manner, deposits can be attacked in a short period of time all over the distribution system.

Many gas works eliminate the naphthalene scrubbers with the adoption of the tetralin treatment.

Quantity of Tetralin Required: Price

The quantity of tetralin required per day for the initial treatment can be calculated from the saturation curve of tetralin, in accordance with the respective solvency in tetralin of the substance to be attacked. If the action of the tetralin vapor is directed against naphthalene in the gas and naphthalene deposits in the mains, the quantity of tetralin required per day is calculated from the simple formula:

$X = \frac{5\,M\,(A+8)}{100{,}000}$; or converted from the metric: $X = \frac{.31\,M\,(2.3\,A+8)}{100{,}000}$;

where:

X = tetralin in kg. per day;
M = gas send-out in cu.m. per day;
A = grams of naphthalene in 100 cu.m. of gas

X = tetralin in lbs. per day;
M = gas send-out in cu.ft. per day;
A = grains of naphthalene in 100 cu.ft. of gas

Assuming for example a daily send-out of 200,000 cu.ft. of gas, containing the average of 6 grains of naphthalene per 100 cu.ft., it would require 14 lbs. of tetralin per day at the beginning of the treatment, or 7/10 of one cent worth of tetralin per 1,000 cu.ft. of gas at the present low price of tetralin.

Experience has shown that the amount of tetralin as found by formula is necessary only in the beginning. After the distribution system has been partly cleaned, the amount can gradually be reduced. After a while, only half of the original amount will be required and finally not more than one-fourth will be needed to maintain a clean distribution system, thus reducing the cost to a minimum.

The tetralin vapor remaining in the gas has a heating value of 15 Kcal or 1.7 B.t.u./cu.ft. and therefore increases the gas output by that amount in heating value. For a gas of 500 B.t.u., the gain would amount to one-third of one per cent.

White Spirit, a Cheaper Substitute

Although the price for tetralin has been brought down to a level low enough to permit the application of the tetralin process to American conditions on an economical basis, there is still another way to reduce the cost of the treatment to a lower figure.

Dr. Weissenberger suggests the use of "White Spirit" in a proportion of 1 part white spirit to 2 parts tetralin. This mixture can be used in the same manner as tetralin alone.

White spirit is a mineral oil product and should answer the following specification:

Specific weight	.770 to .800
Boiling point above	293° F.
Evaporation point below	428° F.
Flast point (open cup) over	86° F.

In Europe, the best white spirit is made from Rumanian oil and is known under the name "Sangajol." It is now also manufactured in the United States; the price quotation is around 16 cents per gallon.

Installation of Vaporizer

The location of the tetralin vaporizer depends largely on local conditions. It is understood that generally one apparatus of sufficient size takes care of the tetralin treatment for the entire distribution system. If the apparatus is placed before the gas holder, the tetralin will act as a valuable protection and cleanser on the inside of the holder but the effects of the treatment in the gas mains will show a little later than with installations located at the distribution side of the gas holder. In some cases, the vaporizer has been placed so that the tetralin vapors may act upon the production mains of the plant. The choice of the location might also be influenced in places where intermediate pressure gas is available. Gas under a pressure of about 5 lbs. can sometimes be utilized to force the tetralin through the injector in the "cold fogging process" and the compressor unit can be eliminated.

Treatment of High-Pressure Gas

Of course, the tetralin process can also be used on high-pressure lines.

In installations of this kind, most satisfactory results have been obtained with the tetralin vaporizer installed at the inlet—that is, the low-pressure side—of the booster. This arrangement has been chosen for all such installations in Germany and it has proven satisfactory in every case. The saturation of high-pressure gas with tetralin vapors offers the advantage that due to the reduced volume of the gas the quantity of tetralin required will be much less than for low-pressure gas. Therefore the tetralin treatment of high-pressure gas is carried out at a much lower cost. For instance, at a temperature of 60° F., it will take 42.5 grams (0.0924 lbs.) of tetralin to saturate a volume of 1,000 cu.ft. of gas, no matter under what pressure the gas stands.

To quote a practical example: Gas is being sent out under pressure of 1 atmosphere and it requires 37 grams (0.0814 lbs.) of tetralin to treat 1,000 cu.ft. of this gas. If this quantity has to be in the gas after its compression, it will suffice to inject one-half of this, or 18.5 g. into the low-pressure gas before it enters the booster. The gas will absorb this amount readily, as it lies far beyond the saturation point of the low-pressure gas.

Conclusion

Tetralin vaporizers of the type mentioned run without operator. The only service needed consists in filling the storage tank, oiling the compressor and occasionally regulating the fogging pressure, which has to be done only in case of extreme changes in the gas send-out. Users of the tetralin process say that it will take at the most 15 minutes of one man's time per day to maintain the apparatus. In return for this extremely small amount of labor, they find that the tetralin process protects the distribution system by:

Dissolving old naphthalene deposits, tar and gummy substance; binding fine flying dust, caused by pipe corrosion; protecting the pipes from inside corrosion; preventing any new formation of naphthalene, tar or gum deposits, and fine dust; keeping diaphragms of gas meters and governors soft and pliable; thus eliminating most of the reasons for complaints and helping in giving better service to the consumer.

Bell Joint Clamps

AT a meeting of the Pipe Joints Committee in Birmingham, Ala., April 7, 1932, the following resolution was adopted:

"At this point the suggestion was made that the term 'leak clamp' was somewhat undesirable and that in the future a different designation should be used. After a brief discussion it was moved, seconded, and unanimously passed that the term 'bell joint clamp' be used in place of 'leak clamp.'"

Since the meeting of the committee, all manufacturers of these clamps have promised cooperation to the committee by using the term "bell joint clamp" in future.

The committee is urging all operating companies to use the term "bell joint clamp" in their purchase orders, records, etc.

Aside from the undesirable implication in the former term, it is felt that the actual use to which the clamps are put does not warrant such term. The clamps are primarily employed to reinforce the joint and in most cases in advance of any leak condition. It would be as logical to refer to caulking as leak caulking or to any other operation designed to make the joint tight.

With the necessary reinforcing of city lines due to higher pressures, the companies are greatly increasing the installation of bell joint clamps on their lines, and to carry them as "leak clamps" on their records would give an entirely false inference as to the system's condition.

The committee hopes that it may have the full cooperation of all company members in adapting the new term, particularly as the manufacturers have complied so fully in its adoption.

Obituaries

Malcolm Scollay Greenough

MALCOLM SCOLLAY GREENOUGH, long associated with the gas light industry and a member of the class of 1868 of Harvard University, died May 28, at his home in Boston after a two weeks' illness. He was born in Cambridge, October 31, 1848. He became president of the Cleveland Gas and Coke Company, of Cleveland, after association with the Boston Gas Light Co.

Hilmer G. Alquist

HILMER G. ALQUIST, of the Boston Consolidated Gas Company, Boston, Mass., died suddenly on June 1.

Monthly Summary of Gas Company Statistics

FOR MONTH OF APRIL, 1932

Issued June, 1932, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

COMPARATIVE STATISTICS OF 202 MANUFACTURED GAS COMPANIES FOR THE MONTH OF APRIL, 1932

	Month of April			*Four Months Ending April 30*		
	1932	*1931*	*Per cent Increase*	*1932*	*1931*	*Per cent Increase*
Customers						
Domestic	8,817,226	8,964,414	— 1.6			
House Heating	51,331	46,077	11.4			
Industrial and Commercial	405,918	400,278	1.4		*See April*	
Miscellaneous	7,890	11,967	—			
Total	9,282,365	9,422,736	— 1.5			
Gas Sales (MCF)						
Domestic	22,245,269	22,586,384	— 1.5	87,789,685	90,895,012	— 3.4
House Heating	2,576,420	2,109,560	22.1	11,581,933	11,203,126	3.4
Industrial and Commercial	6,565,338	7,485,621	—12.3	26,660,276	29,705,137	—10.2
Miscellaneous	198,356	198,490	—	879,498	903,739	—
Total	31,585,383	32,380,055	— 2.5	126,911,392	132,707,014	— 4.4
Revenue (Dollars)						
Domestic	25,609,053	26,067,178	— 1.8	100,924,776	104,720,209	— 3.6
House Heating	1,813,462	1,661,394	9.1	8,164,176	8,557,459	— 4.6
Industrial and Commercial	5,612,465	6,417,698	—12.5	22,977,348	25,746,449	—10.8
Miscellaneous	184,702	172,969	—	727,713	735,136	—
Total	33,219,682	34,319,239	— 3.2	132,794,013	139,759,253	— 5.0
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	14,239,231	16,330,658	—12.8	60,810,668	69,218,254	—12.1
(b) Retort Coal Gas	2,309,708	2,594,187	—11.0	10,173,325	11,397,763	—10.7
(c) Oil Gas	632,939	651,858	— 2.9	3,086,991	3,004,546	2.7
(d) Coke Oven Gas	3,920,951	4,565,091	—14.1	15,974,812	17,530,826	— 8.9
(e) Reformed Oil Still Gas	376,466	376,989	— 0.1	1,624,695	1,457,954	11.4
(f) Total Gas Produced	21,479,295	24,518,783	—12.4	91,670,491	102,609,343	—10.7
Gas Purchased						
(a) Coke Oven Gas	7,579,024	9,235,375	—17.9	32,550,405	38,949,346	—16.4
(b) Oil Still and Natural Gas	5,215,176	429,375	—	21,376,775	1,404,327	—
(c) Total Gas Purchased	12,794,200	9,664,750	32.4	53,927,180	40,353,673	33.6
Total Gas Produced and Purchased	34,273,495	34,183,533	0.3	145,597,671	142,963,016	1.8

COMPARATIVE STATISTICS OF 203 NATURAL GAS COMPANIES FOR THE MONTH OF APRIL, 1932

Customers						
Domestic (Including House Heating)	4,556,713	4,607,724	— 1.1			
Commercial	238,835	235,073	1.6			
Industrial	17,325	16,507	5.0		*See April*	
Main Line Industrial	5,231	4,699	11.3			
Miscellaneous	1,997	2,519	—			
Total	4,820,101	4,866,522	— 1.0			
Gas Sales (MCF)						
Domestic (Including House Heating)	28,158,227	29,502,304	— 5.8	130,000,051	139,889,606	— 7.1
Commercial	4,312,946	4,548,878	— 5.2	21,431,277	21,826,578	— 1.8
Industrial	14,682,404	17,324,844	—15.3	60,444,221	69,031,230	—12.4
Main Line Industrial	10,851,765	15,183,491	—28.5	45,891,536	54,674,775	—16.1
Miscellaneous	698,943	628,130	—	2,736,972	2,354,690	—
Total	58,704,285	67,587,647	—13.1	260,504,057	287,776,879	— 9.5
Revenue (Dollars)						
Domestic (Including House Heating)	18,942,299	19,935,846	— 5.0	86,399,246	92,224,936	— 6.3
Commercial	2,205,661	2,215,526	— 0.4	9,972,388	10,433,519	— 4.4
Industrial	3,119,765	4,149,544	—24.8	13,490,292	16,737,765	—19.4
Main Line Industrial	1,331,598	1,971,196	—32.4	5,730,122	7,239,358	—20.8
Miscellaneous	110,467	95,615	—	455,158	422,470	—
Total	25,709,790	28,367,727	— 9.4	116,047,206	127,058,048	— 8.7

Gas Utility Revenues Drop 6 Per Cent During Month of April

REVENUES of manufactured and natural gas utilities aggregated $58,929,472 in April, 1932, as compared with $62,686,965 in April, 1931, a decline of 6 per cent, according to reports from 405 companies serving 14,102,466 customers and representing over 90 per cent of the public utility distribution of manufactured and natural gas.

Revenues of the manufactured gas companies aggregated $33,219,682 for the month, a drop of 3 per cent from a year ago. The natural gas utilities reported revenues of $25,709,790, which were about 9 per cent under the figures for April, 1931.

Sales of manufactured gas reported for April totaled 31,585,383,000 cu.ft., a decline of 2.5 per cent, while natural gas utility sales for the month were 58,704,285,000 cu.ft., a decline of 13.1 per cent.

A significant feature of the data on manufactured gas was an increase of more than 17 per cent registered in New England in sales of gas for house heating purposes, although the number of house heating customers gained only 2 per cent. The East North Central states, comprising Illinois, Indiana, Michigan, Ohio and Wisconsin indicated an increase of nearly 14 per cent in this class of sales, although the number of house heating customers in April was practically unchanged from the same month of the preceding year.

New York State was one of the few sections of the country to register a gain in manufactured gas sales. In that state total sales for the month were up 1.2 per cent, the result in large part of an increase of some 35 per cent in gas house heating sales.

In most sections of the country domestic sales of both manufactured and natural gas receded but little from 1931 levels. Gas sales for industrial-commercial purposes, however, continued to average from 12 to 15 per cent under the preceding year.

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MANAGING COMMITTEE

J. S. DeHART, Jr., Chairman N. T. SELLMAN, Secretary

Domestic Cooking and Water Heating by Gas and Electricity

By F. R. Wright

WHAT is believed to be the most complete report ever issued on the subject of domestic cooking and water heating by gas and by electricity was recently released by the American Gas Association Testing Laboratory, Cleveland, Ohio. This bulletin comprises a summary of all the available data on the subject collected from the literature of the world. Bulletins and reports of investigations issued by numerous colleges, universities, governmental bureaus, private laboratories, and utility companies, extending over all sections of the United States were carefully read and digested. The results of studies made in Switzerland, France, Germany, Sweden, and England were scrutinized with care, and where sufficient data were given, a brief summary of the results were included. Not only were reports of comparative tests studied, but every article available dealing with, or in any way having a bearing on the subject, was reviewed with a determination to discover the conclusions, if any, that might be drawn therefrom. All of this data were carefully weighed and the significant points disclosed thereby are reflected in the discussion of the subject in the Laboratory Bulletin.

Although this exhaustive survey was made, and in spite of the fact that the Laboratory had made an investigation and issued a bulletin in 1928 under the title of "A Comparison of Gas and Electric Ranges for Domestic Cooking," dealing with the various phases of the cookery question, it was decided to purchase a number of the leading makes of gas and electric ranges and water heaters of the latest models, and test their performance so that the situation as it exists today would be disclosed and could be discussed in an intelligent manner without the fear of successful contradiction. The conclusions drawn by the Laboratory Bulletin are based upon these 1931-1932 tests insofar as they are applicable. Other conclusions not requiring tests for a basis are founded upon current findings. For example, in discussing the initial costs of appliances, the data forming the basis of this were collected at the time the report was prepared.

The situation discussed in this bulletin is competitive, and the various subjects discussed are controversial. The subjects are treated generally, and it is not expected that the facts will apply in each individual case, because of local conditions, and varying gas and electricity rates, and the existence of different merchandising policies in different sections of the country.

Copies of this bulletin may be secured upon application to the American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio. Ask for Laboratory Bulletin No. 4, entitled "Investigation of Domestic Cookery and Water Heating by Gas and by Electricity."

Pipe Joint Research

FEW subjects have created more interest, or are of more importance to the gas industry from an economic standpoint than the one concerned with the construction and repair of pipe joints.

The investigation of this subject which has been carried on for the past two and three-quarter years under the direction of the Subcommittee on Pipe Joint Research of the Distribution Committee of the Technical Section, has resulted in the compilation of a large amount of authoritative data. It has thus been possible to draw definite conclusions as to the best type of new cast-iron bell and spigot joint construction, as well as the most satisfactory means of repairing old joints. The part of the investigation dealing with cast-iron bell and spigot joints has been largely completed, and a report was presented before the annual A. G. A. Distribution Conference in Birmingham, Alabama, in April, setting forth definite conclusions resulting from this study.

The Pipe Joint Research Committee, at its meeting in Birmingham, on April 7, approved plans for investigation of arc welding of steel pipe, and the Laboratory was instructed to proceed with the study of this subject. This has as its principal objective the development of a non-destructive method of test of such joints, suitable for field use.

In addition to the research work referred to above, an extensive investigation was also made on mechanical cast-iron pipe joints for, and at the expense of, the Cast-Iron Pipe Research Association.

Coast Branch Shows Progress in First Year

LITTLE more than a year ago, the Pacific Coast Branch of the A. G. A. Testing Laboratory was opened as a complete approval testing agency. Since that time it has tested nearly 500 separate gas appliances, 177 of which were finally approved by test and 505 approved by inspection. The total number approved includes 367 gas ranges, 151 space heaters, 79 water heaters, and 85 central heating gas appliances.

Twenty Pacific Coast manufacturers joined the Association during the year as the result of the establishment of the Los Angeles Laboratory. All of these companies submitted appliances for approval for the first time during this period. The amount of testing business received from these companies accounted for more than 20 per cent of the total for the year. During this same period twelve California cities adopted ordinances limiting the sale and/or installation of gas appliances to those approved by a recognized testing laboratory. In addition to this the Laboratory has been able to render more prompt testing service at a large saving of time and expense to the appliance manufacturers of the West Coast.

Danish Gas Association Establishes Secretariat

THE Danish Gas Association *(Dansk Gasteknisk Forening)* has established a secretariat. The address is: Direktor P. Larsen, Norre-Chausee 9, Aabenraa, Denmark.

Old Type Holder Camouflaged

The Consolidated Gas Company of New York announces that one of its gas holders near the Hudson River, in New York, is the first of its type in the world to be camouflaged, or painted with a special combination of different colors. Many of the so-called waterless type gas holders have been camouflaged, including four in New York City, but the holder mentioned is the first of the old type "water-sealed" holder to be painted in this manner. The Consolidated Gas Company pioneered in the camouflaging of gas holders, introducing the first multi-colored holder in 1926. Since then, many gas companies throughout the world have adopted this treatment.

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—Hugh McNair, Winnipeg Electric Co., Winnipeg, Man.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association
Pres.—Alfred H. Schoellkopf, Niagara Hudson Power Corp., Buffalo, N. Y.
Chairman, Gas Section—F. C. Weber, The Brooklyn Union Gas Co., Brooklyn, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Public Utilities Association
Chairman—A. D. Mackie, Illinois Power Co., Springfield, Ill.
Sec.—J. R. Blackhall, 617 Public Service Bldg., Springfield, Ill.

Indiana Gas Association
Pres.—F. X. Mettenet, Public Service Company of Indiana, Indianapolis, Ind.
Sec.-Tr.—P. A. McLeod, New Castle, Ind.

Michigan Gas Association
Pres.—J. E. Spindle, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Maryland Utilities Association
Pres.—F. A. Mitchell, Eastern Shore Public Service Co., Salisbury, Md.
Sec.—D. E. Kinnear, 803 Court Square Bldg., Baltimore, Md.

Mid-West Gas Association
Pres.—W. E. Derwent, Geo. D. Roper Corp., Rockford, Ill.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—A. E. Bettis, Kansas City Power and Light Co., Kansas City, Mo.
Sec.-Tr.—N. R. Beagle, Missouri Power & Light Co., Jefferson City, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—I. T. Haddock, Cambridge Gas Light Co., Cambridge, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman, Operating Div.—H. G. Taylor, Lawrence Gas & Electric Co., Lawrence, Mass.
Sec., Operating Div.—R. S. Carter, Malden & Melrose Gas Light Co., Malden, Mass.
Chairman, Sales Div.—J. J. McKearin, Lowell Gas Light Co., Lowell, Mass.
Chairman, Industrial Div.—C. S. Hilton, The Pawtucket Gas Co., Pawtucket, R. I.
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Sec.-Tr., Accounting Div.—C. D. Perkins, Malden & Melrose Gas Light Co., Malden, Mass.
Chairman, Manufacturer Div.—A. M. Slattery, The Hoffman Heater Co., Boston, Mass.
Sec.-Tr., Manufacturers Div.—J. H. McPherson, James B. Clow & Sons, Boston, Mass.

New Jersey Gas Association
Pres.—J. D. Alden, Jersey Central Power & Light Co., Asbury Park, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association
Pres.—R. J. Daugherty, The Empire Companies, Bartlesville, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—James L. Stone, Spokane Gas & Fuel Co., Spokane, Wash.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—Lewis W. Heath, Pennsylvania Power & Light Co., Williamsport, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—E. S. Templeton, Greenville, Pa.
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Southern Gas Association
Pres.—J. J. Brennan, Memphis Power & Light Co., Memphis, Tenn.
Sec.-Tr.—S. L. Drumm, New Orleans Public Service Inc., New Orleans, La.

Southwestern Public Service Association
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Sec.—E. N. Willis, 530 13th Street, SE., Brownsville, Texas.

The Public Utilities Association of Virginia
Pres.—T. Justin Moore, Va. Elec. & Power Co., Richmond, Va.

Wisconsin Utilities Association
Pres.—E. J. Steinberg, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.
Exec. Sec.—J. N. Cadby, 135 West Wells St., Milwaukee, Wis.

Fourteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 10-14, 1932

Personnel Service

SERVICES OFFERED

Sales executive, five years with large manufacturer of house heating equipment ready to take on house heating campaign for utility wanting to increase load. Can train, educate and supervise salesmen that they produce results. Size of opportunity for proving ability and compensation are important factors. **564.**

Management, design, supervision, gas utilities, manufactured and natural. Graduate in engineering with over thirty years' experience in all branches of design, erection, operation and management; familiar with valuation and rate procedure. Specially fitted to handle engineering of large property or group of properties. **565.**

Sales engineer of mature experience, thoroughly competent to establish contacts, make plant surveys, design combustion equipment and sell same for utility or manufacturer. Experience gained with outstanding public utility. Always held responsible positions and prepared to demonstrate ability to take charge of sales department, if desired. Experienced in all fuels. **566.**

Experienced **house heating** sales engineer familiar with application of all types of gas heating equipment. Have sold direct for Eastern gas company and covered territory for leading boiler manufacturer. Technical education and seven years' experience. Age 28; married. Eastern or Southern location preferred. **567.**

Public relations manager or assistant available. Thoroughly experienced in all types of publicity; public speaking organizer and public contact man. Knows all angles of utility problems. Desires a position of responsibility where his experience and wide range of activity will be of value to his employer. **568.**

Engineering specialist in gas plant design and construction (Bachelor and Professional Degrees). Broad international experience with the two leading gas engineering and contracting organizations. Thoroughly familiar with the most modern generating, condensing, cleaning and storage equipment. Wide acquaintance with the principal operating executives of the industry. **569.**

Auditor, long experience utility accounts, rate case investigations, system installations, examinations for purchase; formerly a professional accountant. Knowledge and experience—business law, Federal tax laws, business methods, sales, management. **570.**

Shop foreman, practical in all branches, inside and outside, on services, mains, etc. Married, has a family and will stand my own traveling expenses. **571.**

Manager (46) fully qualified, having had twenty-eight years' practical experience in the public utility business, with manufactured and natural gas, and gas and electric companies. Experience consists of merchandising, organization work, public relations, group commercial and property management, and individual property management. **573.**

Claims executive, eighteen years' experience in charge of claims department large gas and electric company; also gas-electric steals, city of 900,000. Placed all forms of company insurance; developed and supervised accident and fire prevention. Elective officer since 1920. Have managed departments of 200. Member A.G.A., N.E.L.A. and National Safety Council. **574.**

Gas engineer (38) B.S. in M.E. Sixteen years in the gas industry, starting operating period as cadet and ending as superintendent of combination plant. Last eight years with large gas plant equipment manufacturers, last two years as chief engineer. Experience ideal for plant or holding company engineer. **575.**

Executive. Engineering graduate (29) single. Wide experience operating, commercial, customer service and relations, financial, economic research, merchandising, new business, management efficiency in utility field. Desires connection (domestic or foreign) as junior executive, sales promotion, or efficiency reorganization; utility commission engineer or sales promotion manufacturer of appliances. **576.**

SERVICES OFFERED

Merchandising manager available for manufacturer of major "load builder." Has practical utility-dealer cooperative plan of proven acceptability. Will contact operating companies and arrange "set up," also personally create and supervise dealer organization. Familiar with procedure where holding company maintains an approved list. **577.**

Industrial engineer; college graduate (32) several years' experience in both manufactured and natural gas sales, design and combustion. House heating experience. Acquainted with change-over of gas equipment from manufactured to natural gas. Electrical experience also. **578.**

Industrial engineer, (sales) experienced in all branches of industrial furnace application, including surveys, sales and competitive fuel situations, as well as furnace operation; wide experience in both natural and manufactured gas installations; thorough understanding of general sales policies and methods of procedure. **580.**

Manager (Cornell Graduate), at present employed desires responsible position with gas company. Ten years' experience covers manufacture, distribution, merchandising and office work. Excellent record. Age 33. **581.**

Sales executive and engineer, ten years' experience as sales executive and national representative with one company directing sales and selling mechanical equipment to manufactured and natural gas utilities and oil refineries throughout the United States. Open to immediate proposition anywhere. **583.**

House heating and industrial engineer. Technical graduate. Age 29. Six years' utility experience, two with leading manufacturer of ventilating equipment. **584.**

Contact man for manufacturer of gas equipment or gas company. Experienced in gas heating engineering and sales, both natural and artificial gas. Can organize department and train men. **585.**

You surely want progress. So do I. These times bring unusual opportunities. Services available of high grade man at nominal figure in **managerial** or supervisory capacity. Have seen service in all departments through good and bad times. Splendid practical background. Sensible, loyal, careful and excellent character. (49) married. Can handle men successfully having directed all activities as General Manager. **586.**

Secretary (female), for utility executive, with extensive experience in all office work and conversant with the many terms peculiar to the gas and electric industry. Location of no importance. Salary can be set within reasonable limits. **587.**

Sales engineer, (38) technical graduate. Seven years' experience in the installation and operation of natural gas fired power steam boilers. Six years' experience selling auxiliary power plant equipment to public utility and industrial power plants. Fitted to negotiate natural gas sales to this type consumer. **588.**

Experienced salesman (36) familiar with sale and servicing of all types of gas burning appliances desires position with manufacturer or gas company. Will locate anywhere. Has own car and will travel. Married. **589.**

Distribution engineer capable of taking full charge of the distribution system including the economical design of high and low pressure systems. **590.**

Technical graduate who has been cadet engineer, plant foreman, local manager, rate engineer; thorough knowledge water gas operation, high and low pressure distribution, some knowledge of natural gas. Capable of analyzing costs and designing rates. (42) married. Desires connection as **engineer, superintendent** or **manager. 591.**

SERVICES OFFERED

Mechanical and marine **engineer** with many years' all around experience in United States and abroad; has done much drafting, checking and designing for leading utility companies. Linguist. **592.**

Operating and **experimental** engineer now with largest manufacturer and operator of by-product ovens. Specially qualified in maintenance and repair work on older plants. Has conducted large scale experimental work, including design, as well as actual operation. Graduate Engineer (36); background university instructor followed by Teaching Fellowship, Carnegie Institute of Technology. **593.**

POSITIONS OPEN

Manufacturers' agents wanted in a number of territories to take on complete line of warm air furnaces and air conditionings. **0236.**

Domestic gas **appliance salesmen** for work with gas company in the South. Liberal commission basis, permanent position. **0238.**

Manufacturer of approved gas appliances **wishes representation, through manufacturers' agents,** for gas thermostatic controls. **0239.**

Manufacturers' agents and **salesmen wanted** by manufacturer of gas boilers and furnaces, also residence air conditioning systems. Commission basis. Advise lines now handling, and territory covered. **0240.**

Large nationally known manufacturer of automatic water heaters in complete price range, desires **distributor** for Columbus, Ohio territory. An attractive and exclusive franchise is available. **0242.**

Distributorship on complete line nationally known automatic water heaters for Dayton, Ohio territory is available. No missionary work to be done. Real opportunity for live organization. In writing, advise lines now handling. **0243.**

Manufacturers' agents wanted to contact utilities for nationally known water heater manufacturer with complete line of A. G. A. approved gas water heaters. Commission basis. Advise lines now handling and territory covered. **0244.**

Manufacturer of conversion gas range burner for use in coal and wood ranges, or combination coal, wood and gas ranges, desires to place commission **salesmen** or factory **representatives** outside of New England States, especially in the natural gas territories. Prefer men acquainted with the gas utility trade; have no objection to salesmen or factory representatives handling other non conflicting lines along with our product. **0245.**

Superintendent for water gas plant must know technique and the manufacture of carburetted water gas. Must also have had experience in distribution supervision of both high and low pressure systems. Age preferably between 35 and 45; prefer technically trained man. **0246.**

KEY WORDS AND KEY NUMBERS

The key words of each advertisement appear in bold face type; they stand out, arrest and compel attention.

Key numbers mutually protect both parties from annoyance and possible embarrassment.

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